Dental

Abstracts

a selection of world dental literature

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Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
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3. To supply enough data in each abstract and digest that the reader may determine whether he wishes to refer to the original article for more complete information.

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Prosthetic dentistry

Unilateral anchorage for free end dentures by means of stress-breakers and automatic releasing devices

Giorgio Comisso and Giuseppe Sossi.
Riv.ital.Stomat. 12:82-92 Jan. 1958

At the dental department of the United Hospitals of the City of Trieste, Italy, Crismani's method is used in the construction of free end partial dentures to obtain adequate retention by unilateral anchorage.

Partial dentures are subjected to vertical, lateral and horizontal forces. On abutment teeth the vertical forces generally are distributed along the long axis of the teeth by means of the occlusal rests. Lateral forces, however, are inadequately countered by the resistance of the saddles on the oral mucosa or by action of the occlusal rests on abutment teeth. Unless appliances such as pivots, stress-breakers, spiral springs and automatic releasing devices are attached to free end dentures, lateral stress is transmitted constantly. As a consequence the abutment teeth cannot carry their share of the load and the unilateral anchorage becomes inadequate.

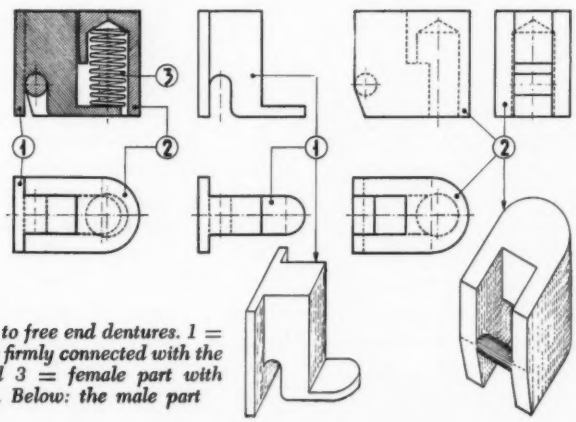
According to Crismani, the unilateral anchorage of free end partial dentures should consist of two parts: (1) the male part which is attached to the pivot, and (2) the female part which is attached directly to the denture. The connection between both parts is obtained by a lingulated device in the male part which can be easily inserted into the spiral spring of the female part.

This type of unilateral anchorage permits rotation in the longitudinal direction and an inclination in the vertical direction but prevents tipping and shifting of the saddle transversally.

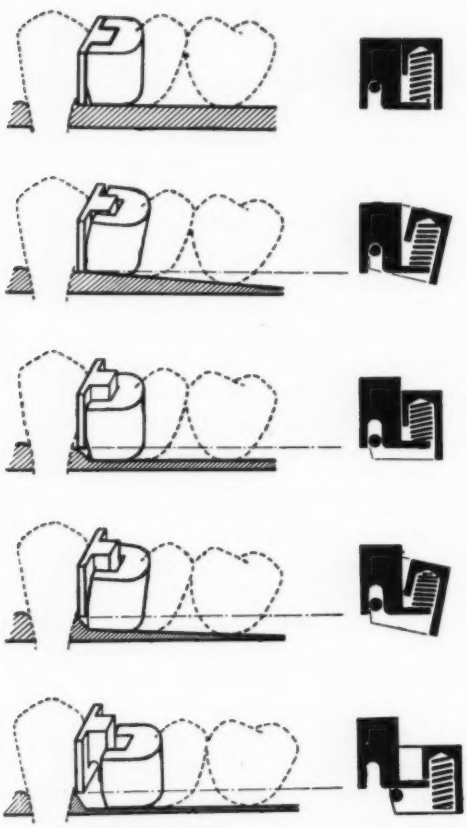
When the inclination of the saddle has reached its limit, the saddle is automatically released from the pivots.

Despite the fact that by the use of a partial denture the occlusal load is distributed among abutment teeth and the edentulous region, additional stabilization of the denture is often necessary to obtain proper function. Overstimulation of tissues and their subsequent breakdown will occur unless the load is evenly distributed. This distribution may be accomplished by clasping an additional number of teeth or by using a lingual or palatal bar to serve as connecting link or as stress-breaker.

For impressions, a reversible hydrocolloid impression material is recommended. Impressions are taken according to the requirements of each instance and different methods are adopted in designing and constructing different saddle types.



Attachments to free end dentures. 1 = vertical plate firmly connected with the pivot. 2 and 3 = female part with spiral spring. Below: the male part



Left: Movements of the saddle. From top to bottom: rest position, longitudinal rotation, vertical displacement, longitudinal rotation combined with vertical displacement, and automatic releasing of the connection between the male and the female parts

Unilateral anchorage of free end dentures. Stress-breaker and automatic releasing device attached

The models should be cast in first quality artificial stone having a minimum setting expansion. The investment models are cast in a hard model investment. The same investment is used for embedding the wax pattern and the investment model. The ring should always be lined with asbestos sheets.

The unilateral anchorage for free end removable partial dentures by means of stress-breakers and automatic releasing devices can be used in design and construction of the following types of saddles:

1. Class I saddles, where there are abutment teeth present at each end of the saddle region, and the clinical and roentgenographic examination has shown that these abutment teeth are capable of carrying the added occlusal and lateral load.

2. Class II saddles, where tooth support is available at only one end of the saddle region, and the occlusal stress has to be carried by the mucous membrane of the saddle region.

3. Class III saddles, where there are teeth at each end of the saddle region and it seems probable that they will be overloaded by the additional occlusal and lateral stress and where the saddle region is not large enough to resist successfully the occlusal stress. Generally, the occlusal load cannot be divided in constant proportions between the teeth and the oral mucosa under a varying load because even if rigid support exists, displacement can take place.

Therefore, the saddle region will be in Class I saddles tooth-supported; in Class II saddles, mucosa-supported, and in Class III saddles, supported by indefinite types of attachments obtaining a controlled load.

Each saddle type may be designed with anterior or posterior support.

Ospedali Riuniti di Trieste, Sezione Stomatologica, Trieste, Italy

Somatoprosthesis, a dental service

Louis J. Boucher. *J.Wisconsin D.Soc.* 34:105-127 May 1958

In 1955 the School of Dentistry, Marquette University, offered the services of its department of oral rehabilitation to the public and to the dental and medical professions. In the department is a division of somatoprosthesis. Somatoprosthesis is that branch of dentistry which prosthetically replaces parts of the body congenitally missing, deformed or lost through accident or disease. As a result of the rapid advances in medical science in the past two decades, more people are surviving traumatic head injuries and malignant neoplasms which in prior years would have claimed their lives. Many of these patients are left severely disfigured.

Twenty-seven illustrated case reports reveal the range of activities of the division of somatoprosthesis. Among the prostheses are dentures and obturators, plugs for ear canals, ears, noses, acrylic splints for the lower anterior teeth of trumpet players, fingers, mouthpieces for typing and writing sticks used by paraplegic patients, and lips and cheeks.

Marquette University School of Dentistry, Milwaukee, Wis.

The pinledge retainer

S. Karlström. *Svensk tandläk.Tskr.* 49:805-813 Dec. 1956

The pinledge retainer has been used for a long time on anterior teeth. The most widely used form of bridge attachment on teeth with vital pulps, however, has been the ordinary three-quarter crown with two parallel grooves in the proximal walls. One disadvantage of this latter type, however, is that the gold becomes fatigued by the masticatory load. A fissure appears between tooth and gold, and eventually the crown loosens. By the use of pinledge retainers, however, the crown can be "locked" to the tooth.

During the past 15 years the author has made more than 1,000 bridges and has used pinledge retainers successfully.

The construction of the pinledge retainer is rather difficult. The incisal edge of the incisor or cuspid is ground. A layer of 1 to 1.5 mm. is removed from the lingual surface. This preparation stops 3 mm. from the gingiva. The proximal walls are made to converge slightly in the incisal direction. This last preparation does not have to extend under the marginal gingiva. Small ledges are made in the lingual wall. In the center of these ledges the holes to receive the pins are drilled. Usually two incisal and one cervical hole are drilled. To reduce the possibility of injury to the pulp, the cervical hole is placed close to one of the proximal walls. In the event the holes have to be made very shallow, two incisal and two cervical holes are drilled. A spiral bur is used for the drilling.

On bicuspids and molars the occlusal surface is ground down so that the finished crown will be 1 to 1.5 mm. thick. The proximal surfaces are prepared so that they converge slightly in an occlusal direction. Next, the preparation on the lingual surface is made, to end 2 to 3 mm. from the gingiva. The edges between the lingual facet and the proximal walls are rounded. Four pin holes are made, one on each corner of the occlusal surface, 1 mm. from the edges. In this way the danger of injuring the pulp is reduced. The preparation should be judged for each tooth; for this purpose, roentgenograms are important.

The depth of the pin holes should be from 2.5 to 3 mm. on incisors and cuspids, 2 mm. on bicuspids and from 3 to 3.5 mm. on molars. The diameter of the hole is 0.8. mm.

The advantages of the pinledge retainer are as follows:

1. It provides a safe, secure anchorage for the longest possible time.
2. The pulp remains intact.
3. There is minimum irritation to periodontal tissue.
4. The possibility of secondary caries is reduced.
5. There is less possibility for fracture of the crown.
6. The least possible tooth substance needs to be removed.
7. A relatively small amount of gold is visible.
8. The pinledge retainer can be used on all teeth.

Nygatan 37, Gävle, Sweden

Periodontics

Experimentally produced neurodystrophia in the periodontium of dogs: possibility of a relation between neurodystrophia and periodontal disease (Speransky's theory)

D. Swrakow, K. Keworkian, M. Wiss, E. Atanassowa and D. Matteew.
Deut.Zahn Mund Kieferhk. 28:200-220 March 1958

Speransky's theory of the pathogenesis of periodontal disease is discussed frequently in dental literature. There are as many advocates of this hypothesis as there are opponents. Recently, however, part of Speransky's doctrine (that neurodystrophia, the primary degeneration of the cells of the trigeminal nerve, plays an important part in the development of periodontal disease) has been almost uncritically accepted by many authors (Reitter and Ritter, Wawersick and Struck, Wischnewsky and Huneke).

The results of serial investigations, carried out at the Stomatological Faculty of the Medical Institute of the University of Sofia, Bulgaria, revealed that no relation exists between neurodystrophic processes in the periodontal membrane, the gingivae or the alveolar bone and periodontal disease. Leptospirosis, caused by *Leptospira canicola,* is not a causative factor in diseases of tissues surrounding the tooth roots.

In 14 dogs, one or two years old, neurodystrophia in the periodontium was experimentally produced by injecting a 1 per cent morphine solution per kilogram body weight into the gingival tissue and insertion of sterile glass fragments into the surgically exposed pulp of two or four left upper teeth. The teeth of the right side of the upper jaw and those of the entire lower jaw served as controls. In two dogs, a silk thread ligature was used to exert mechanically a stimulating effect on the trigeminal nerve and its ophthalmic, tentorial, anterial, lacrimal and nasociliary branches.

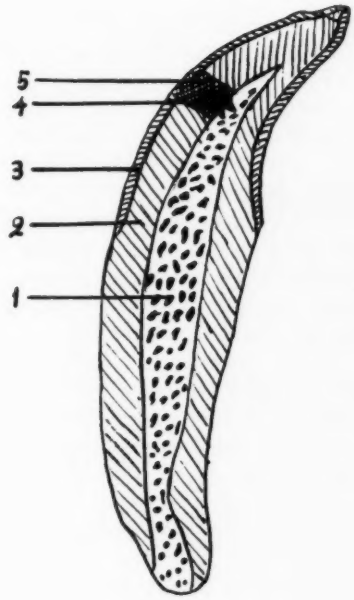
Serologic examinations were made prior to and during the experiment, mainly to establish whether *Lept. canicola,* the causative microorganism of leptospirosis in dog and man, was present. The result of these tests, in which Gsell's agglutination reaction was used, showed that in 10 dogs *Lept. canicola* was identifiable in kidneys and liver. These 10 dogs were afflicted with oral papilloma. No other traumatic, chemical or infectious lesions were observed.

The experimentally produced neurodystrophic processes caused the development of a syndrome (neurodystrophic syndrome) which consisted of temporary inflammation of the periosteum, deepening of the gingival pockets of the treated teeth, hyperemia and swelling of the gingivae, spontaneous hemorrhage, destruction of the interdental papillae, reduction of the alveolar bone, conjunctivitis, slight paralysis of the ocular muscles and increased lacrimal secretion.

Although some of these symptoms are similar to those of periodontal disease, the syndrome itself could not be identified with any form of periodontal disease.

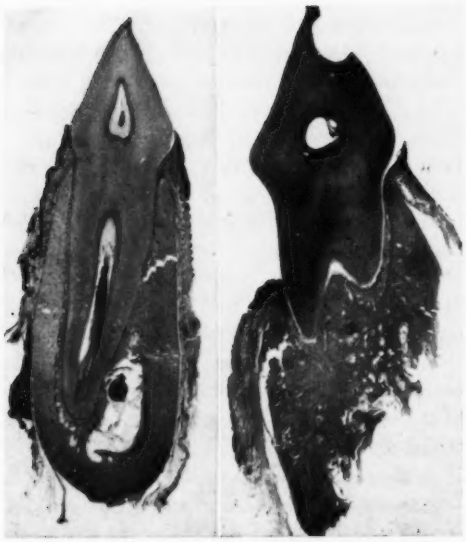
The similarity of some symptoms and the dissimilarity of others require further research to confirm or disprove Speransky's theory which suggests that the neurodystrophic factor has a determining importance in the pathogenesis of periodontal disease.

G. Sofiisky 1, Sofia, Bulgaria



Experimentally produced neurodystrophia by inserting sterile glass fragments into the surgically exposed pulp of a dog. 1 = pulp, 2 = dentin, 3 = enamel, 4 = glass fragments, and 5 = silicate cement filling

Above: Periodontium of a dog prior to insertion of glass fragments to produce neurodystrophia. Below: Periodontium of a dog three months after insertion of glass fragments



Left: Normal periodontium of a dog. Right: Experimentally produced neurodystrophia. Symptoms similar to periodontosis, such as degenerative processes in connective tissue of the periodontal membrane and bone resorption

Cortisone in treatment of hypertrophic gingivitis

A. Messina. *Rev.mens.suisse odont.* 68:122-129 Feb. 1958

The anti-inflammatory effect of cortisone and hydrocortisone, reported by several authors, was investigated at the department of periodontics of the Dental School of the University of Milan, Italy.

From patients with hypertrophic gingivitis (from 18 to 25 years old), taken at random, two groups were formed: (1) those in whom gingivectomy was performed prior to the investigation, and (2) those in whom gingivectomy was contraindicated. All these patients had been treated previously with various antibiotics, antiseptics or astringents without clinical evidence of success.

During the investigation, each patient received ten subgingival injections of cortisone or hydrocortisone totaling 25 mg.

In Group I, hypertrophic tissue growth recurred after treatment in the majority of instances.

In Group II, the symptoms of hypertrophic gingivitis did not subside after treatment.

The expected result, therefore, was not obtained. Histopathologically, however, it was observed that the growth of mesenchymal tissue was somewhat inhibited by the cortisone and hydrocortisone treatment.

Clinica Odontoiatrica dell'Universita di Milano, Italy

Practical periodontics

S. Cripps. *D.Practitioner* 8:215-219 March 1958

The dental profession of the world, with the exception of a small minority, has failed to master the enigma of periodontal disease. What is lacking is a philosophy of treatment. The early recognition and thorough elimination of local irritants and the safeguarding of operative results are the only means available for treatment. The systemic factor remains baffling and elusive.

The dentist should go back to the scaler and perfect a thorough, methodical technic. Initially, this will limit one's efforts to the less advanced conditions. As proficiency and judgment progress, more difficult conditions can be treated.

Scaling is not a simple operation that can be mastered overnight. A delicate sense of touch must be developed that can differentiate calculus from tooth structure and can permit handling the inflamed soft tissues gently with minimum trauma. Thorough scaling implies a coverage of all the tooth surfaces, followed by a rapid exploration of the entire tooth contour with a sharp probe to detect any specks that may have been missed. The enthusiast must be cautioned against using excessive pressure with these cutting instruments which can strip the cementum and gouge the dentin in one foul stroke.

Supragingival calculus is claylike in consistency, obvious to view, and easy to remove. Deep in the pocket, however, the calculus is flintlike and tenaciously adherent to the tooth surface, forming what appears to be an organic union. The proximal aspects of the roots of posterior teeth present a slight indentation in the long axis of the tooth; often deposits lodged in this area give the root a deceptive contour and convey the impression that no calculus is present. Many treatment failures are attributable to this oversight.

Subgingival scaling is facilitated by packing a pellet of cotton soaked in iodine or mercocresols, under fair pressure, between the gingiva and the tooth. The pellet is left in place for a few minutes; when it is removed and the area dried with a blast of warm air, the task of subgingival scaling is made easier.

Much more than is expected can be achieved in periodontal therapy by scaling only, particularly when periodontal disease is treated in its early stages. Even in the more advanced and chronic stages, the meticulous removal of all deposits, planing and smoothing of the root surfaces, and curetting of the spongy granulations of the lateral wall of the pocket produce surprising results.

At the beginning, it is advisable to use infiltration and block anesthesia for deep subgingival scaling and curettage. As confidence and proficiency increase, more of this work can be performed with only a topical anesthetic.

Pumice and brush should be used at practically every visit during the course of treatment. The

use of pumice and brush keeps the mouth clean and conditions the patient's tongue to the feel of clean, smooth tooth surfaces.

Gingival packs made up of zinc oxide, resin, tannic acid powder and clove oil are used as dressings and displacement agents. Their main function is to reduce inflammation and enlargement, and make the deeper deposits more accessible to the scaler. Other medicaments are useful for their shrinking and cauterizing properties. An astringent and healing action can be produced with a 40 per cent silver nitrate solution with Churchill's iodine as a reducing agent and a saturated solution of phenol, placed at the base of the pocket and neutralized with alcohol for one to two minutes, and Talbot's iodoglycerol solution, painted on inflamed and hyperplastic tissues.

Sixty per cent trichloracetic acid with bicarbonate of soda as a neutralizer is a dangerous drug, but in selected instances of recurring and persistent granulation is an excellent cauterizer. Reduction of the gingival level invariably will disclose a piece of serumal calculus. Great care must be exercised in the use of all these drugs. Operation areas should be well dried and other parts of the mouth protected with cotton rolls and gauze swabs. Neutralizers should be at hand.

Sound oral hygiene is essential. The most gratifying results offer no hope of permanency without the intelligent, meticulous cooperation of the patient. The patient should be taught the need for the regular use of toothbrush, woodstick and mouthwash. No time and labor should be invested in a patient who is only mildly interested.

7 Devonshire Street, London W.1, England

Effect of C-avitaminosis on the supporting structures of the teeth

Jens Waerhaug. *J.Periodont.* 29:87-97 April 1958

Vitamin C deficiency generally is accepted as one of the predisposing factors in periodontal disease. The present study was launched with the purpose of trying to ascertain whether a long-standing vitamin C deficiency in the monkey would lead to a clinical and histopathologic condition similar to that of periodontal disease in man.

Four young monkeys were placed on a diet deficient in vitamin C for periods varying between 42 and 257 days. Clinical signs of scurvy appeared after about 90 days. Histologic examination after 257 days revealed nearly complete destruction of the collagenous fibers of the periodontal membrane, increased osteoclastic resorption and hemorrhages. Most of the deciduous teeth present at the beginning of the experiment were still present at the end. The following conclusions can be drawn:

1. The contention that loss of teeth is an early symptom of scurvy may depend on normal shedding of deciduous teeth having been taken as loss of permanent teeth.

2. Clinical signs of scurvy are bleeding from the gingivae and increased mobility of the teeth. Loss of permanent teeth seems to be a rather late symptom.

3. The histologic characteristics of scurvy are disturbance of dentin and bone formation, destruction of the collagenous fibers, increased osteoclastic resorption and capillary bleeding.

4. The Sharpey's fibers inserted into the cementum are not destroyed to the same extent as those inserted into the alveolar bone; the former may be protected by the epithelial rests of Malassez.

5. The absence of osteoclastic resorption of the cementum also may be related to the presence of epithelial rests.

6. The periodontal fibers least affected by the C-avitaminosis are those just below the epithelial cuff and above the alveolar crest. This explains why downgrowth of epithelium did not occur more frequently.

7. The epithelial structures are not involved to the same degree as the connective tissue, although the epithelium is obviously weaker.

8. The first stage of increased mobility seems to be facilitated by the destruction of the periodontal fibers, whereas the extreme mobility in the later stages seems to be facilitated by the resorption of the alveolar wall.

9. The histopathologic picture of the periodontal structures of monkeys with C-avitaminosis does not resemble that of periodontal disease in man.

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Anthropology

Anthropology and dentistry

S. M. Vreedenburg. *Tschr.tandheelk.* 65:213-219 March 1958

A close relationship exists between anthropology and dentistry.

Among the items on display in the Tropical Museum of Amsterdam, The Netherlands, during the exhibition "Medical Art and Medicine Men," which was organized by the Royal Tropical Institute of The Netherlands and held from December 1, 1957 to May 31, 1958, were several pieces associated with teeth or dental diseases.

The belief that the art of healing through the power of magic is inherently connected to fetishes containing teeth or tooth images is, even in modern times, not entirely confined to primitive races or people. In Western Europe, similar concepts of the magic powers of teeth have persisted to the present time.

In western civilization where every aspect of science, medicine and dentistry has been analyzed rationally, all the gods, spirits and demons, previously held responsible for the development of disease, have been replaced by bacteria, spirochaeta, rickettsia, viruses, molds, yeasts and certain nutritional deficiencies. The demonic impact of factors causing disease has been reduced to the no less devilish appearance of microorganisms observed and identified by microscopic research. In medieval Europe, the plague and many other epidemics were associated with the presence of specific demons. But even in enlightened man of the twentieth century, some peculiar concepts of disease-causing factors are suggested and believed. There exists, for instance, an exaggerated fear of the consequences of irradiation—whether from the rays of the earth, roentgen rays or atomic rays—which certainly has been caused by an irrational clinging to superstition, irrationality or pseudoscientific interpretation.

The practice of medicine men of primitive people, therefore, should not be labeled as being completely irrational. A definite rational element enters into his diagnosis whenever it can be based on insights gained from repeated symptoms frequently observed. The same experience will enable him—in a similar rational way—to select the treatment method to be applied.

In anthropological studies it is often observed that rational and irrational elements are interwoven almost indiscriminately in the practice of medicine men.

Indian medicine men of the Rio Ucayali region in Peru collect for diagnostic purposes the urine from their patients in a specific container (gourd). This gourd, frequently decorated with magic symptoms such as tooth ornaments, is exposed to the sun and closely watched. If the urine contains an abnormally high amount of sugar, the filled gourd attracts the attention of many bees and wasps. Because these insects are held as emissaries of the sun, the obvious conclusion is that the disease (diabetes) must be conceived as a punishment inflicted by the sun. Therefore, medicine men forbid such patients the consumption of "solar" foodstuffs such as cereals, honey, sugar and sweet fruits; nutriments which the

(Illustrations on opposite page)

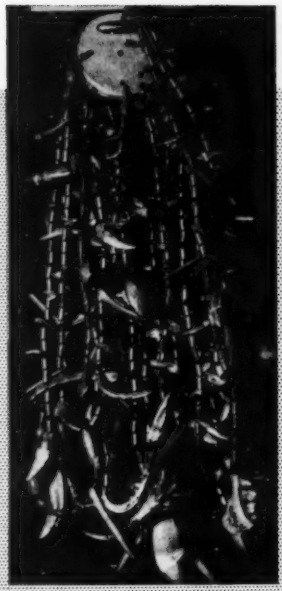
1 Necklace consisting of teeth of various animals. It is worn by medicine men in attempts to cure oral diseases (South Borneo)

2 Relics, supposedly the authentic teeth of St. Apollonia (original or copies), prevent and cure dental caries and periodontal disease (Belgium)

3 Magic cane crowned with a molar of a deceased man. Remedy for toothache (Belgium)

4 Fossil teeth from a Chinese pharmacy. Such teeth are sold either intact or in pulverized form as medicaments for the cure of diseases of the mouth. Anthropologic studies of such teeth have often resulted in identifying extinct species of man and animals

5 Fragment of a painted cloth from a Chinese pharmacy in Java, Indonesia. "Sakit Gigi" is the Malay term for toothache



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modern physician also excludes from the diet of diabetic patients. If the gourd is visited by carrion beetles (which indicates that the urine contains pus and protein), this is taken for a sign of threatening death. Here, again, is an irrational interpretation of a rational effect.

Anthropologists have found the same irrational interpretations of rational effects in the medicine man's use of fetishes to prevent and cure dental diseases.

Fr. v. Mierisstraat 36, Amsterdam-Z, The Netherlands

Anatomical and comparative studies of the mandibles found among remains of Paleolithic man

Carlo E. de Vecchis. *Ann.stomat.,Roma* 7:67-87 Feb. 1958

In 1952 and 1956, remains of Paleolithic man were discovered and excavated in the Polesini Grotto near Bagni, Italy. Among them were an almost intact mandible with 14 teeth, another with all teeth and an intact ascending ramus, and a large fragment of a mandible. Anatomical and comparative studies of the teeth revealed a severe occlusal and interproximal attrition and an exposure of dentin occlusally, incisally and interproximally.

In recent man, an anatomically perfect occlusion is practically nonexistent because the basic factors which would make such an occlusion possible are absent.

In prehistoric man, however, these basic factors were present and were essential for the development of a type of dentition and occlusion never observed in recent man: specifically an anatomically correct occlusion. The simple explanation of this phenomenon, that the evolutionary reduction in the size of the jaws in recent man must have caused the increase in malocclusion and dentofacial anomalies, does not account for the occurrence of the comparatively milder conditions which comprise by far the greater proportion of deviations from the normal occlusion observed in civilized man.

An anatomically perfect occlusion can develop only when there exists a sufficient attrition to permit all teeth in the dental arches to assume a correct occlusal relationship. This type of occlusion existed in Paleolithic man. The tooth indexes were above those registered in recent man, and the crowns were larger and wider in their buccolingual dimensions. The dental arches, regular and elliptical, showed a perfect occlusion due to attrition. The presence of bone defects, especially at the alveolar wall of the first molars, could be attributed to an apical infectious process which later was demonstrated by roentgenographic examinations.

In a comparison between the dentition of Paleolithic man and that of recent man, the following factors were considered: (1) conditions of osseous structures and dental arches; (2) relations between occlusion and attrition; (3) anatomic characteristics of the teeth; (4) histopathology of the hard tooth substances; (5) anatomy and pathology of the periodontium, and (6) development of pulp defects that had been caused by attrition.

It seems that the process of continued tooth eruption is a characteristic only of the much more primitive process of continual growth of all surface epithelial structures to replace loss caused by frictional wear and tear. The hereditary process of continuous tooth eruption is a characteristic common to all human races and types; it is a biologic necessity to compensate for loss due to attrition.

Clinica Odontoiatrica, Universita di Roma, Italy

Oral surgery

Use of elevators for tooth extractions

G. Boering. *Tschr.tandheelk.* 64:715-729 Nov. 1957

The elevator or "exolever" is an instrument designed for removal of teeth or tooth fragments by a lever or wedge action. Its effect depends on the stability of the fulcrum and the grip on the tooth to be extracted. Usually an adequate fulcrum is formed by the external oblique ridge, the palatal margin of the alveoli and by adjacent teeth. The grip can be improved by cutting a notch in tooth or root surfaces with a bur.

In routine dental practice, the use of forceps is preferable to the use of elevators for extraction because less damage is caused to the surrounding tissue. The use of elevators, therefore, should be restricted to instances in which forceps cannot be used.

Of the elevator types available, a straight shank elevator with a hollow blade from 2 to 4 mm. wide, is recommended. This instrument is especially useful for eliminating roots in the upper jaw and, in isolated instances, root or tooth fragments in the lower jaw. It also can be used for dislodging teeth which are lingually or labially displaced, for extraction of upper and lower molars (by wedging interdentally) and for detaching the gingival margin from the tooth surface prior to extraction.

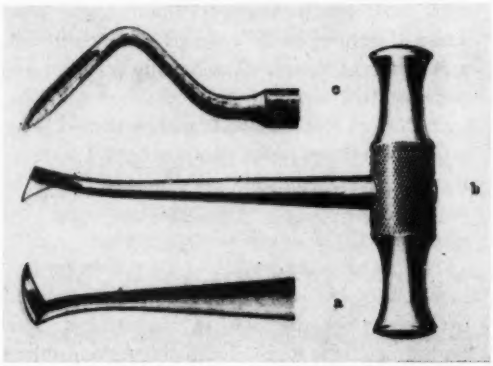
The mechanical action is wedging rather than levering and is combined with rotation and dislocation. If a root has fractured obliquely, the point of approach is the most elevated part of the inclined surface.

Wedged interradicularly and slowly rotated, the elevator separates the roots of fractured or severely carious molars.

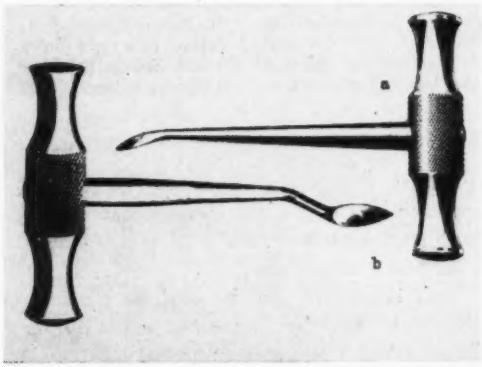
The 2 mm. blade is designed for eliminating small root tips. Clear vision of the region of operation is of the greatest importance. In eliminating teeth or tooth fragments in the upper jaw, care must be taken to avoid involvement of the antrum.

When teeth are to be removed with an elevator, it is advisable to tilt the dental chair slightly backward. When the operation is in the molar region, this inclination should be increased. The patient is requested to bow his head and to turn it a little. The chair should be placed high enough to provide a clear vision of the involved region.

Cryer's elevator or the heavier Winter's lever are indicated for the extraction of lower teeth. These instruments have sharp points on their



Types of light elevators
a = Cryer's elevator
b = Winter's lever
c = angulated elevator



Types of heavy elevators
a = Winter's exolever
b = Lecluse's elevator

Above: Position of the operator's fingers during removal of a right lower third molar with Lecluse's elevator. Center: Position of the patient's head, fixation of his lower jaw during removal of a right lower third molar with Lecluse's elevator. Below: Removal of a lower third molar with Winter's exolever

triangular, slightly curved blades. The point of approach usually is at the mesial surface of the tooth fragment or root, at a notch to be cut with a bur or at a bifurcation.

Both instruments can be used for removing roots which have been separated with a bur, or for sectioning deeply seated root tips.

The lighter angulated elevator is useful for removing small root tips in the lower jaw. This instrument, however, is too delicately constructed to withstand great force. Special care should be taken to avoid involvement of the inferior alveolar nerve.

Winter's exolever has a sharp point to accelerate the extraction of third molars. The fulcrum is formed by the buccal osseous structures and the adjacent tooth.

Lecluse's elevator is a comparatively massive instrument. It can be used for the removal of lower third molars. Great force can be applied by rotating the instrument with a crossbar handle. In routine instances, this procedure should be avoided because it may damage hard and soft tissues, fracture adjacent teeth or even the jaw. It can be used successfully for extraction of a third molar with a fully erupted and healthy crown. Prerequisite to use of this instrument is that no endodontic treatment has been performed and no carious lesion is present.

The technics and types of elevators described have proved their value in many complicated operations performed by staff members and dental students of the Department of Oral Surgery of the University of Groningen, The Netherlands.

Oostersingel 59, Groningen, The Netherlands

Observations in the treatment of deformities and injuries of the facial bones during the last fifty years

Varaztad H. Kazanjian. *Massachusetts D.Soc.J.* 7:9-12 April 1958

Fifty years ago the teaching of oral surgery consisted of lectures on the diseases of the teeth and soft tissues of the mouth. The only practical experience that the student received was in the extraction of teeth. Patients with fractured jaws usually were sent to the dental schools for treatment, since immobilization of the jaw fragments required construction of splints, which could be made only in the prosthetic department.

The use of existing teeth as abutments for immobilization by means of wire sutures has been practiced since the time of Hippocrates. The Barton bandage, four-tailed bandages and interdental Gunning's splints have been in use since the middle of the eighteenth century. Interosseous wiring was first used by Buck of New York in 1847.

One of the great contributions of the dental profession in the surgical treatment of traumatic injuries of the jaws was the fundamental principle that broken jaw fragments should be immobilized to harmonize with the occlusal relationships of the teeth, and that when part of the jaw is missing, the remaining fragments should be immobilized in accordance with the dental occlusion. When this primary rule is violated by surgeons whose primary object is to insure bony union, the result often is impaired function and facial deformity.

Between the two World Wars, research in the administration of local and general anesthetics led to advances which made it possible to operate on many more patients, with greater safety. Progress in the prevention and treatment of surgical shock, and in methods of preserving blood and plasma and their intelligent use, has been enormous. The discovery of chemotherapeutic agents and antibiotics for the prevention and treatment of infected wounds has broadened the scope of the surgeon's effectiveness.

Facial injuries resulting from wars and automobile accidents have put a greater burden on the present-day surgeon; the complexity of injuries requires a knowledge not only of oral surgery but of other surgical specialties.

When the wounded patient is taken to the emergency ward, the first concern should be to find out how serious the injury is. If there are only lacerations of the soft tissues, careful suturing soon after the injury will minimize the resulting scar. The following precautions should be taken before closing the wound:

1. The wound should be cleaned mechanically with sterile soap and water and flushed with sterile saline solution.

2. The wound should be inspected for foreign bodies, especially if there has been contact with dirt. This precaution also applies when lacerations of the oral cavity are examined. Broken particles of teeth or parts of dentures may be imbedded in the soft tissues of the mouth.

3. Active bleeding points should be controlled.

4. With a sharp knife the loose tags of tissue should be shaved from the surface of the wound.

5. The wound should be sutured with fine suture material and a pressure dressing applied.

These simple rules appear elementary and obvious, but a large portion of the work of oral surgeons is the repair of conspicuous scars, which would not be necessary if primary suturing had been done effectively.

Today, fracture of the upper jaw is a more common injury than formerly, and it is more serious than lower jaw fracture because of the relation of the maxilla to the rest of the skull. Cerebrospinal rhinorrhea invariably is suspected from possible fracture of the cribriform plate. In the event of cerebrospinal leak, unless the spinal fluid stops spontaneously within a very short time, the patient should be operated on to stop the leak. The safe procedure for the maxillofacial surgeon is to consult with a neurosurgeon in instances of severe fracture of the maxillary and zygomatic bones.

475 Commonwealth Avenue, Boston, Mass.

The effectiveness of an antihistamine to reduce pain following oral surgical procedures

M. R. Holland and P. E. Jurgens. *Oral Surg., Oral Med. & Oral Path.* 11:138-140 Feb. 1958

An experiment was designed to study the effect of an antihistamine, chlorprophenpyridamine maleate, on the incidence and degree of pain after oral surgical procedures performed in the clinic of the School of Dentistry, University of Minnesota.

Patients who needed oral surgery were told that the authors were studying a drug which was reported to offer a beneficial effect to healing after oral surgery. Patients were asked whether they wished to participate in the study, but were not advised of the control phase of the experiment. They were assured that the drugs would not harm them and might help them, and they also were informed of the drowsy feeling which might occur after taking the drug. The patients varied in age from 16 to 76 years.

On alternate days experimental and control solutions and tablets were given to the patients in the study. The subjects in the experimental group received an intramuscular injection of 25 mg. of chlorprophenpyridamine maleate about 30 minutes prior to surgery. They also were given four 8 mg. tablets of the same drug with written

instructions to take one tablet after each of the next three meals and one tablet at bedtime the night of the operation.

Patients in the control group were given an intramuscular injection of 0.25 cc. of physiologic saline solution about 30 minutes prior to surgery. They received also four placebo tablets of milk lactose and were instructed to take one tablet after each of the next three meals and one tablet at bedtime the night of the operation.

Each patient was given an envelope containing ten pink-colored acetylsalicylic acid tablets, and written instructions to take no more than two tablets every four hours if necessary to relieve pain. They were asked to return those tablets they did not use. A record was kept of the number of tablets used.

Patients in the experimental group had 91 operations, those in the control group, 90 operations.

The mean number of tablets taken by patients was determined. Statistical analysis of these figures showed that the results obtained were not statistically significant.

On the basis of this study, it appears that the antihistamine tested does not reduce significantly pain after oral surgery.

School of Dentistry, University of Minnesota, Minneapolis, Minn.

Prevention and control of surgical shock or shocklike syndromes by suppression of the autonomic nervous system

A. Benzer, W. Caithrami, A. Groszschedl and H. Stolzer. *Arch.klin.Chir.* 281:225-230 Oct. 1957

The human body possesses an ingenious defense mechanism which maintains and restores normal conditions.

Traumas caused by disease, accidents or surgery damage organs and tissues, and produce reflex reactions, especially of the autonomic nervous system. These traumas may be so severe that they accelerate the process of shock. If surgical shock or shocklike syndromes continue uncontrolled, the pituitary adrenal system may fail in its function and the human organism can no longer adapt itself to the changed state. Prevention and control of surgical shock, therefore, are important to dentists, oral and general surgeons.

Mechanical causes of surgical shock are as follows: (1) improper positioning of the patient during surgery; (2) compression of the vena cava superior by pressure which diminishes the venous return to the heart; (3) sudden changes in the patient's position producing hypotension; (4) compression of the large blood vessels by tumorous growth; (5) obstruction of the deep airways, and (6) increase in intrathoracic pressure. These mechanical factors, associated with severe blood loss, stimulate the autonomic nervous system in an attempt to regain hemodynamic balance.

Sympathetic stimulation with an increased secretion of the adrenal glands can be observed during surgery by various symptoms such as sudden perspiration, increased pulse rate, paleness and coolness of the skin and rapid decrease in temperature. Before this dangerous stage is reached, impending surgical shock can be discovered by continuous recording of the oxygen content of the circulating hemoglobin and by capillary dilatation or constriction ("green light reflex").

If the surgical shock is long and severe, the sympathetico-adrenal system fails and vasodilatation, associated with increased capillary permeability, occurs.

In early stages of surgical shock, sympathomimetic drugs should not be given because they may produce an increase in vasoconstriction, a decrease in blood pressure and an increase in oxygen and metabolic requirements.

In the stage of vasodilatation, the vessels are paralyzed and cannot respond to the effect of sympathomimetic drugs. Surgical shock can be prevented and controlled by blocking the hyperactive reflex stimuli of the autonomic nervous system.

Suppression of the autonomic nervous system has been used at the Surgical Clinic of the University of Graz, Austria, in more than 1,000 patients experiencing surgical shock. The patients were adequately oxygenated, and blood transfusions, if required, were carried out without complication.

During surgical shock there exists a stasis of the circulating blood, associated with hypoxemia,

which produces damage to the walls of the blood vessels. Changes may occur in the central coagulating mechanism. These factors frequently accelerate the formation of a thrombus.

Suppression of the autonomic nervous system is an excellent preventive procedure against the occurrence of thrombosis.

Chirurgische Universitätsklinik, Graz, Austria

Treatment of fractures of the jaws and facial wounds

Luis Ploner. *Atti Soc.med., Bolzano* 6:73-84 June-Sept. 1957

The immediate problem which confronts the surgeon in treating fractures of the jaws and facial wounds caused by traffic accidents is the prevention of obstruction of the airways and of hemorrhage. Accurate hemostasis of the injured vessels, and—if necessary—immediate tracheotomy will prevent dangerous complications.

The additional steps consist of the following: (1) an accurate debridement of the wounds, and (2) the best possible repositioning of detached fragments after roentgenographic examination.

Repair of the mutilated facial and oral regions by means of local or distal flaps should be undertaken as soon as the patient's condition permits.

At the Municipal Hospital of Bolzano, Italy, the reduction and consolidation of detached fragments is obtained with the help of specially designed dentures. Such dentures are especially indicated in instances in which loss of bone had occurred or several teeth are missing.

In the treatment of fractures of the lower jaw, ferrules attached to both alveolar arches with wire loops, surrounding each tooth in the fracture line, are used.

Four successful cases are presented. Two patients, who had suffered fractures of the lower jaw, were treated with intraorally applied wiring; the required traction was exerted by means of rubber bands.

Two patients had fractures of the upper jaw (Guérin's fracture, Class I, and Le Fort's fracture, Class I). The first patient was treated by insertion of a prosthetic plate applied to the hard palate and secured in position by wire loops attached to each tooth. The prosthetic plate, divided into two equal parts, was united by a chromium bridge which permitted a progressive approximation of the two halves by gradual turning of an attached screw. The second patient was treated by the traction exerted by wires which were passed through his cheeks and run from the inserted denture over the upper alveolar arch to a head cap made of plaster of paris.

In all instances, postoperative roentgenograms revealed that the fragments were held in position and the prognosis for an eventual union was favorable.

Pfarrgasse 13, Bolzano, Italy

Cause and surgical treatment of intratemporal facial paralysis

L. B. W. Jongkees. *German M.Monthly* 3:77-81 March 1958

Success or failure in the surgical treatment of patients with intratemporal facial paralysis depends more on the length of the interval between the initial phase of the disease and the operation than on the causative factors. If surgery can be performed a few weeks after the usually sudden onset, the prognosis is favorable. If the continuity of the impaired facial nerve has not been interrupted, decompression will lead to improvement and healing in almost all instances whether otitis media, traumatic lesions or peripheral facial paralysis (Bell's palsy) had caused the characteristic distortion of the face. Complete recovery will take place comparatively soon, usually within six weeks.

In intratemporal facial paralysis of a longer duration, the result of surgical intervention is less satisfactory. Grafting will be necessary when trauma (skull or jaw fractures or surgical defects), inflammation (otitis media) or tumor (cholesteatoma) has destroyed parts of the facial nerve. This nerve grafting obtains comparatively good results but never complete recovery.

Surgical treatment of intratemporal facial paralysis, performed at the Wilhelmina Hospital of Amsterdam, The Netherlands, obtained the following results:

1. With surgical decompression of the impaired facial nerve in instances caused by Bell's palsy, otitis media or posttraumatic palsy: (1)

complete recovery, 50 per cent; (2) minor evidence of facial asymmetry, 22 per cent; (3) gradual improvement, 22 per cent, and (4) no or slight improvement, 6 per cent.

2. With nerve grafting: (1) greatly improved but with a certain degree of facial asymmetry, 35 per cent; (2) satisfactory improvement, 45 per cent, and (3) no or only slight improvement, 20 per cent.

Charles Ballance and A. D. Duel stated in 1932, "Every patient with intratemporal facial paralysis should be operated on immediately after diagnosis, no delay is justifiable." Their words may be too emphatic, but they should be remembered.

Wilhelmina Gasthuis, Amsterdam, The Netherlands

Hyaluronidase in dental surgery—a clinical investigation

A. D. Macalister. *Austral. D. J.* 3:1-5 Feb. 1958

Hyaluronidase was tested in a clinical study on 20 patients whose third molars had been extracted. On completion of the operation, 3 mg. of hyaluronidase, dissolved in 1 cc. of sterile water, was injected into the buccal tissues adjacent to the wound. Twenty control patients undergoing the same operation received no hyaluronidase. All 40 patients were dismissed with instructions to use frequent hot saline mouthwashes after six to eight hours. All returned the day after operation, and the writer assessed the extent of swelling, pain and trismus by observation and by questioning the patients. The degree of initial unstrained opening between the incisal edges of the upper and lower incisors was measured in centimeters.

More patients in the group not treated with hyaluronidase complained of postoperative pain than in the group receiving hyaluronidase. The degree of swelling for both the experimental and control groups was about the same. Those in the experimental group "recovered" more rapidly than those in the control group. On the other hand, some patients in the experimental group were in acute distress with painful trismus when seen the day after operation.

Hyaluronidase should be used in dental surgery as an adjunct to careful surgery. Even in this role, there are occasions when its efficacy leaves much to be desired. The results of this survey were not as dramatic as those previously reported.

P. O. Box 647, Dunedin, New Zealand

The badly scarred bilateral cleft lip: total resurfacing

T. Ray Broadbent. *Plast.& Reconstr.Surg.* 20:485-488 Dec. 1957

For total resurfacing of the badly scarred bilateral cleft lip with a free full thickness clavicular graft, the following technic is used:

Under general endotracheal anesthesia the total surface of the upper lip is removed. The incision is extended in dart fashion into the floor of each nostril, around each alar wing into the nasofacial fold, down this fold to each oral commissure and along the vermilion border. Care is taken to preserve the musculature of the lip but to remove thoroughly scar tissue. Total hemostasis is obtained with electrocoagulation. When the dissection is complete, a tight, short upper lip becomes relaxed and elongated. The specimen of lip with the cutaneous scars usually is about half the size of the relaxed defect to be resurfaced. The full thickness clavicular graft is trimmed of subcutaneous fat but the dermis is not rigorously trimmed. A good thickness is desired for fullness of the lip. The graft is fixed to the lip peripherally with no. 000000 silk sutures, with the ends left long. Tacking sutures are placed but no darting is done. A paraffin gauze and dry dressing is tied onto the graft with the long ends of the sutures; no other bandage is applied. To keep the lip quiet postoperatively, a nasal gastric tube is used for feeding and the patient is kept relatively flat in bed. Nasal and oral drainage gravitate away from the lip and the dressing is kept dry. A total take of the graft can be expected and is essential for a good result. The original dressing is removed on the seventh to tenth postoperative day, the sutures removed, and a paraffin strip and elastic adhesive bandage maintained for an additional seven to ten days. Oral feeding is allowed after removal of the first dressing, but the use of straws and sucking are not permitted that early.

The procedure can remove completely telltale cleft and "cat whisker" scars, and it contributes to better function of the lip.

A case report illustrates the results obtained.

508 East South Temple, Salt Lake City, Utah

Tranquilizing drugs in oral surgery

Lucian Szmyd, Clarence M. McCall and Earl T. Enright. *J.Oral Surg.* 16:310-313 July 1958

The use of promazine and meprobamate to control postoperative sequelae in oral surgery was evaluated clinically in 150 military patients, each of whom required removal of an impacted mandibular third molar. The patients' ages ranged from 17 to 52 years. The double blind technic was used. Neither the patient, the surgeon, nor the observers knew which subjects had received promazine, meprobamate or the placebo until the study was completed. Patients were given 11 capsules of the specified preparation and instructed to take one capsule on the night before and one on the morning of surgery. Postoperatively, patients took one capsule three times a day until all the capsules were expended. Each capsule contained either 25 mg. of promazine, 400 mg. of meprobamate, or lactose.

The following conclusions were drawn:

1. No significant effect was noted on the postoperative sequelae of pain, swelling or trismus.

2. Tranquilizing drug therapy failed to influence the postsurgical narcotic demand.

3. The incidence of untoward reactions was increased by the tranquilizing drugs, but not significantly.

4. The number of days lost during postoperative convalescence was increased significantly for patients on promazine or meprobamate therapy.

On the basis of these observations, the use of promazine or meprobamate cannot be recommended for the control of postoperative sequelae in oral surgery.

School of Aviation Medicine, U.S. Air Force, Randolph Air Force Base, Texas

A case report on replantation

Hugo A. Owens. *Bul.Nat.D.A.* 16:79 April 1958

A 13 year old boy had his maxillary left central incisor knocked out while playing in a schoolyard. His teacher recovered the tooth and, five minutes after the accident, had the patient in the author's office. Clinical and roentgenographic examination revealed no fracture of bone or damage to the other teeth. The socket was filled with blood and the tooth was normal and intact.

The patient was instructed to bite on a sterile gauze pad while the tooth was being prepared for replantation. The tooth was washed in a saline solution, rinsed in a bactericidal solution, scrubbed with gramicidin soap and washed again with saline solution. The pulp was removed, the chamber and canal were filled, and the apex was reduced by about 2 mm. The tooth again was cleaned and rinsed, and replanted in the untreated socket and held in place under moderate pressure for 20 minutes. An analgesic was prescribed and 400,000 units of penicillin administered.

Twenty-four hours later the patient reported no undue pain. The tooth was immobile but sore to pressure. A slight amount of plasma oozed from the socket and there was considerable edema in the region. The oral cavity was irrigated with warm saline solution and the surrounding tissues were swabbed and painted with a counter-irritant. The patient was instructed to rinse his mouth with warm saline solution every four hours.

Five days later the tooth no longer was sore to pressure, and the edema was less obvious. One month later the tissue surrounding the replanted tooth had returned to a normal, healthy state. The tooth was well anchored. All soreness had disappeared. Roentgenograms showed no abnormal changes.

Frequent roentgenographic and clinical examinations over a two year period have revealed no pathologic changes in the tooth or in the periodontium.

621 Effingham Street, Portsmouth, Va.

The teaching of dentistry in Latin America

M. de Magalhães Chaves.
Bul.Pan American San.Bureau 43:1-16 July 1957

Today there are 60 dental schools in the Latin American countries: 30 in Brazil, 9 in Mexico and 4 in Colombia. All the other Latin American countries have one to three schools of dentistry with the exception of Panama which has none. New dental schools are being organized and soon will be opened in Brazil, Colombia, Peru and Argentina. All the dental schools (with the exception of a few in Brazil) are faculties of a university and have the same status as the other faculties of the university.

The duration of dental studies is five years in most of the schools and four in a few. Most dental schools are supported by the government of the country and (with the exception of a few) do not receive tuition fees from students. Among the best dental schools in Latin America are those of the Universities of Argentina, Brazil, Chile, Colombia and Mexico. Even schools not affiliated with a university are, at present, and will be from now on, supported by their respective governments. The physical facilities of the dental schools and the availability of modern equipment reflect the conditions existing at the universities to which the dental schools belong.

The number of years of preparatory studies varies between 11 and 13 including grammar school, high school and predental or preuniversity studies. In some schools dental courses are given in the evenings with a large attendance of students of both sexes. In some countries the number of women dentists is large. There is a considerable exchange of students between Latin American dental schools. In a few countries where dental schools have been established recently, teachers in the basic medical subjects and in the dental specialties are difficult to find. In countries facing this problem it would seem advisable to simplify the curriculum for the present and to offer a complete program when faculty members are available.

In the schools that are established and have been functioning for several years, the first two years of dental studies are devoted to basic medical sciences. The first contact of the student with the specific practices of the profession occurs at the beginning of the third year. This schedule, however, is not advisable because in those two years of medical studies, the student is not familiarizing himself with dental technics, which should be taught simultaneously with the basic medical sciences. In still other schools there is a reaction against too much technical teaching and specialization. The technical, biological and social aspects of dentistry should be given simultaneously.

The current trend seems to be to shorten the professional studies by deferring to postgraduate courses the technics which are not essential in the general practice of dentistry. Directors and teachers in Latin American dental schools should meet regularly to prepare programs of studies, reorienting them according to the new trends in dental teaching.

Pan American Sanitary Bureau, 1501 New Hampshire Avenue, N.W., Washington 6, D.C.

Bird's eye view on dental education and dental research in some universities of Europe

Victorino G. Villa. *J.Philippine D.A.* 11:17-20 Feb. 1958

Two systems of dental education are practiced in Europe today: the stomatologic system and the autonomous system. In the first system, as practiced in Italy and Austria, dentistry or stomatology is regarded as a specialty of medicine. Dental education involves a two-year postgraduate course, with an M.D. degree a prerequisite for the postgraduate study of dentistry.

Under the autonomous system as practiced in Switzerland, The Netherlands and Germany, dental education is independent from medical

education, and dental practice is governed by a separate dental law. At the universities of Utrecht, Zurich and Munich, dental and medical students take the same basic medical science courses for about 30 months. Switzerland and Germany have a five-year dental course; in The Netherlands, it is six years. In these three countries, one can practice dentistry after completing the dental course without any dental degree. If one wishes to obtain a dental degree, Dr.Med. Dent., he must re-enroll in the university, pursue a program of graduate study and pass a comprehensive oral and written examination, and present an approved thesis or dissertation based on original investigation or research.

Graduates of the stomatologic system do not render a quality of dental service superior to that rendered by graduates of the autonomous system. More dental research appears to be done in countries under the autonomous system than in countries under the stomatologic system. The Scandinavian countries, with the autonomous system, for instance, lead all Europe in dental research. One weakness of the stomatologic system is that there is a tendency for the stomatologist to practice both medicine and dentistry.

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A survey of changes in curriculum content in American dental schools since 1935

Bruce L. Douglas. *J.D.Educ.* 22:177-182 March 1958

The subjects recommended by the curriculum survey committee of the American Association of Dental Schools in 1935 were compared with those offered in catalogues of American dental schools today. The following changes are most noticeable:

1. Physics and organic chemistry no longer are given in the four-year dental curriculum of any school.

2. The interpretation of the term "oral medicine" has taken on a connotation wider than that given by the committee. This is evidenced by the courses today grouped under oral medicine.

3. More courses are classified as "applied biological sciences" in the present dental curriculums.

4. Clinical dental science courses which attempt to emphasize the application of basic science material to clinical practice (particularly dental caries and physiology of occlusion) are being offered.

5. Courses in maxillofacial, postsurgical and cleft palate prosthesis are given in a number of schools.

6. Branches of medical practice (for example, neurology, psychiatry, dermatology, obstetrics, oncology) and physical diagnosis are covered in more detail.

7. Periodontics and endodontics have evolved into separate fields of study.

8. Oral surgery now includes basic training in general surgery and hospital orientation.

9. In a few schools anesthesiology is taught as a separate subject and is separated from the course in oral surgery.

10. There is a greater emphasis on research and biostatistics in the curriculums of dental schools.

11. Public health, both general and dental, has evolved into separate courses of study.

12. Various courses in writing and speech have been introduced into the curriculum.

13. The list of courses grouped under "miscellaneous" in the survey reveals the effect of the changing times on the dental school curriculum. This has become particularly apparent through the introduction of courses in civil defense, first aid and human genetics. Recognition of the importance of habits, feelings, attitudes and behavior of the dental patient is demonstrated by the inclusion of courses in psychology and psychosomatics at several schools.

93-08 Queens Boulevard, Rego Park 74, New York, N. Y.

Biochemistry

Pyruvic reductase in oral, ocular, liver, and brain cortex tissues

Bertram Eichel, Heron E. Pena and Arnold A. Swanson. *Air Univ., School Aviat.Med.* 1-8 Jan. 1958

A spectrophotometric study of pyruvic reductase activity in a number of tissue homogenates in the white rabbit led to the following observations:

1. Pyruvic reductase activity was identified and estimated in gingiva, tooth pulp, submaxillary gland, tongue mucosa, retina, choroid, lens capsule and epithelium, lens cortex, lens nucleus, liver and brain cortex. The retina possesses the greatest enzyme activity.

2. High concentrations of sodium cyanide and sodium oxalate pronouncedly inhibit pyruvic reductase activity. Low concentrations of sodium cyanide and nicotinamide inhibit the enzyme slightly.

3. The addition of semicarbazide to the reaction mixture in the absence of cyanide results in an apparent definite activation of retina and gingiva homogenate pyruvic reductase activity. This is partially due to the interaction of semicarbazide with pyruvate and may be due primarily to the metabolism of semicarbazide. The addition of semicarbazide to the crystalline liver dehydrogenase system results in only slight activation. The latter could be accounted for by the interaction of pyruvate with the semicarbazide.

4. The reaction completely favors the conversion of reduced diphosphopyridine nucleotide to its oxidized form, indicating that the reaction involving the reduction of pyruvate with the probable formation of lactate equilibrates with the total conversion of pyruvate to lactate.

Department of Experimental Dentistry, Air University, Randolph Air Force Base, Texas

Studies on the acid decalcification of human dental enamel. I.

Joan E. Hills and H. R. Sullivan. *Austral. D.J.* 3:6-18 Feb. 1958

In view of the diversity of opinions concerning enamel solubility and the bearing that this has on the pathogenesis of dental caries, the solubility of powdered dental enamel was studied in a series of citrate and lactate buffers with various pH values, containing various amounts of calcium phosphate (hydroxyapatite).

The constituents of the enamel dissolve in the proportions in which they occur in the solid phase. The pH value at which this solution occurs depends on the concentration of calcium and phosphorus in the environment. There was no preferential solution of the carbonate from the enamel, nor did the presence of carbon dioxide in the system have any effect on the solution of the enamel.

2 Chalmers Street, Sydney, Australia

A histochemical study of the composition of enamel in the region of white carious spots

A. B. Sharpenak, N. V. Nikolaeva and E. A. Magid. *Stomat.,Moscow* 36:2:8-10 March-April 1957

Detailed studies were carried out to determine the chemical characteristics of tooth enamel in the region of white carious spots. The first study was devoted to the calcium and protein content in the white spot and its surrounding enamel.

The material was obtained from previously healthy persons who had been killed in accidents. The teeth were cut through the white spots with carborundum disks. For calcium observations hematoxylin or anthrapurpurin were used as reagents.

Slides of 20 teeth were prepared with hematoxylin. In all teeth there was no, or very little, change in color in the normal enamel, but the white spots in the enamel became bluish purple.

Similar results were obtained from the experiments with four teeth stained with anthrapurpurin. This intense coloring was found to be

caused not by quantitative but by qualitative changes in the enamel, the changes of the protein-mineral complex.

Regarding the protein content in the white spots, many experiments with various modifications of biuret tests proved unsuccessful. When 0.2 per cent ninhydrin solution was used as a reagent, interesting data were obtained. On 13 slides the dentin changed into purple, the normal enamel did not change or gave a slight pinkish purple color, but the enamel of the white spot changed more intensively, especially at the margins, into a dark purplish color. Evidently there was an effective proteolysis releasing a great amount of free amino acids.

The following conclusions were reached:

1. The ability of the white carious spots to change color might be used to diagnose the commencement of caries.

2. The proteolysis on the border of the affected enamel indicates that the destruction of the enamel starts with increased proteolysis.

Medghis, Petrovka 12, Moscow, U.S.S.R.

The role of fluoride in tooth enamel

George L. Clark. *Torch* 31:37-49 Jan. 1958

Exactly what does fluoride in controlled trace amounts in drinking water do to teeth? Chemistry now has the modern instrumentation—including the electron microscope and roentgen-ray and electron diffraction analysis—to answer this question.

Tooth enamel is 96 per cent inorganic mineral. This crystalline protective layer on teeth is identical with the well-known calcium phosphate mineral, hydroxyapatite. The basic hydroxyl groups in this compound readily react with acids, and may be replaced in the crystal lattice by fluoride ions without affecting in any way the structure of the apatite; hydroxyapatite now becomes fluorapatite. The fluoride ions are just a little smaller than the hydroxyl groups which they replace, so that the crystal lattice is tightened slightly, as shown by a slight shift in the lines on the crystal pattern. A measurable increase in hardness and a decrease in solubility of the mineral and the tooth enamel may be detected when one out of each 300 hydroxyl groups is replaced with fluoride.

This amount of fluoride in enamel, corresponding to only 0.013 per cent by chemical analysis, is the equilibrium concentration resulting from the presence of 1 ppm of fluoride in drinking water. In the physiologic processes of the human body, this trace amount of fluoride is transferred from water to the blood plasma and in turn is built into the teeth of infants before eruption. When hydroxyapatite mineral or tooth enamel is placed in a solution of a fluoride, the exchange of fluoride for hydroxyl by diffusion is exceedingly slow except at elevated temperatures. The most beneficial effect of fluoride is brought about by introduction during the early stages of tooth formation and deposition of the mineral matter on a network of fine organic fibrils during development of the embryo.

Fluoride plays an important role in addition to its substitution in hydroxyapatites. Average tooth enamel contains 3.98 per cent carbonate which is not distributed uniformly in the apatite but segregated in localized regions. The reaction of acids on carbonates to produce carbon dioxide gas seems to be the cause of "soft spots," which readily react with acids in the foods and in the mouth to form the beginnings of the lesion which results in dental caries. Fluoride even in minute amounts completely eliminates these carbonate regions, so that there is no chance for acid reaction.

Fluoride has other effects on dental enamel, on dentin and on cementum. For example, hydroxyapatite is converted at a relatively low temperature to another calcium phosphate mineral compound, whitlockite, with a different structure. Such a change could be a highly disruptive process in teeth and bones. In the presence of traces of fluoride in the apatite, this transformation temperature is raised to above 600°; thus fluoride has a stabilizing and preserving effect.

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Physiology

Examination of enamel surfaces of teeth of Papuan natives

H. L. Tollens. *Schweiz.Mschr.Zahnhk.* 68:113-116 Feb. 1958

P. O. Pedersen and D. B. Scott (1951) concluded that the microscopic structure of enamel cannot be influenced by genetic factors.

To test this hypothesis, the unique lamination and reticulation appearing on the enamel surfaces of the teeth in Papuan natives were studied microscopically at the department of "sosiodontia" (operative dentistry) of the University of Groningen, The Netherlands.

The topographical details of 87 teeth were studied. Fifty-five teeth came from Negroid Papuans living in widely scattered places along the Dutch New Guinea coast, and 33 from Melanesian Papuans belonging to mountain tribes of the region near the Wissel Lakes.

Although the term "Papuan" is applied to all native inhabitants of Papua (New Guinea), Melanesia and the islands of the East Indian Archipelago, anthropologically they represent a heterogeneous Negroid race with a specific Oceanian and not African culture. The origin of this isolated race has not been established.

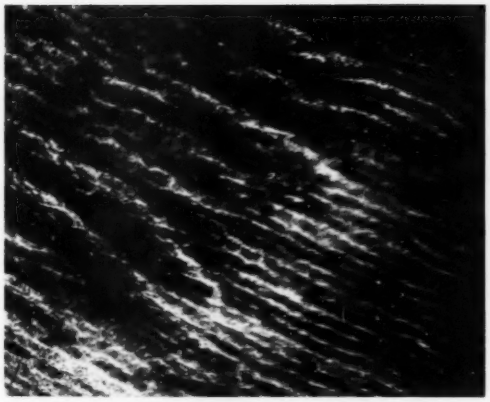
Several of the teeth examined had large cavities; the majority, however, had to be extracted because of progressive periodontal disease. There was an unusually large accumulation of hard and soft calculus. Most of the teeth showed severe attrition, occlusal and proximal; several showed an irregular enamel extension.

After the calculus was removed, the teeth were placed in tubes containing a 6 per cent sodium hypochlorite solution. The teeth remained in the solution for 24 hours, were cleaned with a soft rotating brush and fine abrasive powder (precipitated calcium carbonate).

After thorough cleaning and drying, the teeth were studied under a binocular microscope which permitted a thirtyfold magnification. This examination method combines the advantages of a quick observation and evaluation of all topographical details of the enamel with a clear picture of the other tooth structures. Replicas were made of the tooth regions of special interest by using Pantke's technic.

The teeth of the Papuans from the mountainous regions showed more irregularities in the enamel than those of the Papuans from the coastal areas. Severe corrosion, attrition, deep fissures, irregular perikymata and characteristic boundary lines between enamel, dentin and cementum and lamination, were the principal microscopic details observed. Disfiguration of the enamel,

Left: Lower molar of a Papuan from the mountainous region. Right: Enamel surface of a lower molar



Left: Perikymata and wavy lines on the enamel of an upper cuspid. Right: Reticulation on the occlusal third of an Eskimo molar (Pedersen and Scott)

termed by Pedersen and Scott "reticulation," was not observed. Macroscopic and microscopic pits were seen occasionally. The disappearance of enamel surface structure seems to be associated with the advancing age of the individual. An identical rate of progress in loss of enamel was observed in the teeth of aged Papuans from both the mountainous and the coastal region.

Grouping of the teeth by the age of the individual and the degree of occlusal attrition revealed that the factors which caused intensive attrition did not contribute significantly to the loss of enamel structure.

The high proportion of microscopic and macroscopic irregularities on the enamel surfaces in teeth of Papuans obviously resulted from influences of a nongenetic nature which were exerted during or immediately after tooth formation. The "micro tubercles" observed in Papuan teeth were identical with the surface defects termed "micro pits" by Pedersen and Scott.

After examination of the enamel surfaces of 87 Papuan teeth, the conclusion reached—that the microscopic structure of the enamel and the development of various abnormalities appearing on the surfaces were not influenced by genetic factors—seems to verify the theory of Pedersen and Scott, stated in their article *Replica Studies of the Surfaces of the Alaskan Eskimo, West Greenland Natives and American Whites, Acta Odont. Scand.* 9:262, 1951.

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Occlusion in temporomandibular joint pain

Ernest R. Granger. *J.A.D.A.* 56:659-664 May 1958

The temporomandibular joint functions as though it were a moving ball and socket joint. While the condyle is rotating on the disk with a ball-and-socket-like action, the whole ball and socket is moving on the glenoid fossa. These actions always take place simultaneously but in a great variety of combinations.

Man is an omniverous animal. He chews his meat, potatoes and vegetables at the same time. To perform this minor miracle he is endowed with the hinge action of the carnivora and the gliding action of the herbivora through the medium of his gliding ball and socket joints. To accomplish this, some of the teeth must have cusps; cusps are the only means of maintaining harmony of the two simultaneous chewing actions without injury to the joints or the supporting structures.

The upper teeth being fixed in the maxilla and the lower teeth in the mandible, since the mandible is related to the maxilla by the joint, the relation of the teeth to each other must be determined by their relation to the joint.

Occlusal disharmonies which, by their relation to the joint, cause a derangement of the condyle to disk relation, may produce characteristic joint symptoms. Factors other than the occlusal relation may produce similar manifestations, but in those instances which are of dental origin this disturbed

relation is always present. In these patients the psychogenic factor is ever-present and sometimes can be a serious problem in treatment. Many times correction of the occlusal problem is adequate to bring the symptoms under control, but is difficult to evaluate in prognosis.

Clinical qualitative diagnosis is relatively simple, but exact diagnosis and treatment require a precise mounting on a suitable instrument capable of accurate reproduction of joint to tooth relations. Tooth grinding and removable splints sometimes will bring temporary relief, but offer no permanent solution as a treatment for a sick mouth.

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Salivation in man in various stages of acclimatization to a hot climate

K. M. Smirnov and E. L. Skliarchik.
Sechenov Physiol.J. 43:365-368 Nov.-Dec. 1957

Salivary secretion in men variously acclimated to the high atmospheric temperatures in Termez, Uzbek Soviet Socialist Republic, was investigated. Saliva secretion from the right parotid gland was collected by means of the N. I. Krasnogorskii capsule. All tests were carried out on people sitting quietly in the laboratory. Most of the experiments were carried out between July 17 and August 5, 1954, during a period when the daytime temperature was never lower than 35°C. (95°F.) Salivation was studied in 11 young male inhabitants of Termez and in three men ranging in age from 37 to 42 years and in two women, aged 26 and 33, members of the expedition who arrived in Termez from Leningrad on June 11, 1954. The findings pertaining to the five expedition members were compared with the results of control tests carried out on them in Leningrad later that year.

No regular diurnal variations were observed, approximately identical quantities of saliva being collected at various hours. Considerable differences in salivary secretion, and variations for the same person in different experiments, were observed. Nevertheless, even in the small number of tests conducted, a definite relationship was established between the quantitative secretion of saliva and the degree of acclimatization of the subject. The following conclusions were reached:

1. Under hot climatic conditions, the basic salivary secretion and the secretion in response to the stimulation of the oral cavity with water or with acid solution in persons who are not acclimated are less than the corresponding secretions in the same persons in a temperate climate.

2. The salivary secretion of persons who have been living only a short time in a hot climate is less than that of persons long exposed to the hot climate.

3. A comparatively slight restriction of fluid intake in hot climates leads to a pronounced reduction or a complete cessation of salivary secretion.

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Pathology

The problem of carcinoma of the tongue in India

J. C. Paymaster and P. D. Shroff. *Am.J.Surg.* 94:450-454 Sept. 1957

Carcinoma of the tongue was observed in 4,200 of 30,000 patients with carcinoma recorded in the outpatient clinic of the Tata Memorial Hospital from 1941 through 1955. Of the 4,200 cases, 700 unselected cases were studied; in 520, the carcinoma was at the base of the tongue, and in 180 the disease was on the anterior part. Eighty per cent of the patients were men, and the highest incidence of this disease was noted in the age group of 40 to 45 years. Leukoplakia coexisted with carcinoma in 32 per cent of the patients. In ten patients there was evidence of more than one carcinoma in the oral cavity, and in all ten the disease appeared to develop from isolated patches of leukoplakia.

In the State of Bombay the large Hindu community consists of two sections. Carcinoma of the posterior third of the tongue was seen most frequently in the men of the Gujrati sect which has a history of excessive smoking of a locally prepared cigarette called the "biddi." Sixty per cent of patients with carcinoma of the base of the tongue had palpable metastatic lymph nodes in the neck, and 50 per cent of these were bilateral. The superior group of the deep cervical chain of lymph nodes frequently was affected and gross disease in this site invariably proved fatal.

In the Deccani sect of Hindus in whom the habit of chewing betel nut with slaked lime and tobacco was most prevalent, the anterior portion of the tongue and particularly its lateral borders were affected more often. The women of this sect also shared the habit and this disease. Evidence of malnutrition and avitaminosis was also noted in a fair proportion of these women.

Of the 700 cases of carcinoma, 10 per cent were in stage 1 (primary growth localized to the tongue, less than 3 cm. in its longest diameter, no palpable metastatic nodes in the neck), 30 per cent were in stage 2 (small or moderate-sized lymph node metastases on one side of the neck), and 60 per cent were in stage 3 (the primary growth or the metastases were advanced).

The 520 patients with carcinoma at the base of the tongue (many of whom had extension of the disease to the cervical lymph nodes) were treated exclusively with roentgenotherapy. The five year survival rate was 25 per cent.

Of 180 patients with cancer of the anterior portion of the tongue, 62 were treated exclusively by surgery, with a five year survival rate of 32 per cent. The remaining 118 patients were treated either by roentgenotherapy alone or by a combination of roentgenotherapy and surgery; the five year survival rate was only 20 per cent. No conclusions can be drawn from these results because of the dissimilarity of conditions in the two groups.

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Recurrent parotitis

H. P. Krepler. *J.A.M.A.* 166:1890 April 12, 1958

To differentiate recurrent parotitis from mumps and from chronic glandular or interstitial processes, it is essential to examine the secretion and to obtain a sialogram.

During the acute phase of recurrent parotitis the secretion is mucopurulent, but in the remissions it is white, flocculent, and slightly turbid. This flocculence is best seen when the secretion is drained through a cannula into a test tube. Even if the swelling is unilateral, the roentgenograms usually show a bilateral, grapelike cystic enlargement of the end ramifications of the duct system. Such changes were demonstrated on both sides during the first unilateral attacks in an infant of 16 months.

These observations favor the belief that the changes in the duct system, depicted roentgenographically, are not primarily the sequel of chronic inflammation but represent an anatomic factor (congenital sialodochiectasis) which facilitates the invasion of the parotid duct system by bacteria of the oral cavity. Such other factors as the bacterial content of the oral cavity, the pa-

tient's resistance, and the secretion and discharge of saliva also must be considered. The condition of the opening of the Stenson's duct, which was larger than usual in the 13 patients studied, may be a contributing factor. This idea does not rule out the occurrence of secondary destructive changes or of the distention of the duct system arising from a local inflammatory process. Antiseptic mouthwashes, the instillation of antibiotics, and general treatment with phenoxymethyl penicillin were recommended.

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Critical evaluation of theories on dental focal infection

J. Kubin. *Časop.lék.česk.* 96:960-963
July 19, 1957

Periapical, periodontal, pericoronal and residual infections, infected pulps and root canals, and certain types of stomatitis have been associated frequently with dental focal infection.

It can be assumed that focal infection is initiated by bacteria or products of bacterial decomposition carried through the lymph or blood stream, and by sensitization due to allergic reactions.

The defense mechanism of the human organism, including the blood circulation, is not always able to destroy all the types of microorganisms which may cause dental focal infection. The bacteria present in infected root canals, however, are not necessarily identical with the bacteria of the oral flora.

Bacterial adaptation to environment is generally recognized. Environmental changes, therefore, also may cause changes in bacterial morphology. Dental, tonsillar and prostatic foci are the most significant sources of focal infection. The relation between impacted or devitalized teeth and focal infection, however, has not been established.

Fear that dental focal infection may be the cause of systemic diseases occurring in distant parts of the body has influenced many physicians to demand tooth extractions on a large scale. For dentistry as well as for medicine, the adoption of such a course obviously was a severe error.

The dental profession recognizes the importance of preserving the natural teeth whenever possible and regards an indiscriminate elimination of all nonvital teeth as indicative of an overenthusiastic approach on the part of physicians. Even prosthodontists realize the limitation in function of artificial substitutes for natural teeth.

Although some controversy still exists as to whether systemic diseases are caused by or can be attributed to dental focal infection, recent research has established that dental focal infection has little or no relation to many systemic diseases which previously had been associated with it. In view of the fact, however, that bacteremia may follow oral surgical procedures and that the presence of bacteria in the blood stream is capable of causing subacute bacterial endocarditis in certain patients, it is advisable that dental foci of infection should be removed immediately after detection.

Current practice in the use of antibiotic and chemoprophylactic agents for prevention of bacteremia and focal infection consists of the following: (1) intramuscular injection of procaine penicillin; (2) adequate dosage of chlortetracycline hydrochloride, chloramphenicol or oxytetracycline hydrochloride, and (3) in instances in which antibiotics are contraindicated, substitution of sulfonamide compounds.

Dentistry and medicine should re-evaluate previous opinions and theories on dental focal infection, and continue with the re-evaluation until existing and persisting controversies are replaced by scientific facts.

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Nuclear changes in oral epithelium in pernicious anaemia

P. C. Farrant. *Lancet* No. 7025:830-831
April 19, 1958

In 39 patients with pernicious anemia, the insides of the cheeks were scraped to obtain preparations of oral mucosa, and the squamous cell nuclei therein were measured. In 25 of the 39 patients, re-examinations were made at periods varying from 2 to 32 months. Material from 95 normal patients of varying ages also was examined. In each examination, 100 nuclei were measured in

both longer and shorter axes, and the averages of these measurements were used for comparison.

When nuclear size is related to age, a surprising increase of the shorter axes of the nuclei becomes evident. The effect is obvious only in patients over the age of 60 years. If normal controls of nuclei from patients of 60 years and over are compared with nuclei of patients with pernicious anemia in the same age range, a significant difference arises.

When the nuclei of all 39 patients with pernicious anemia, including those few patients with normal nuclear size, are compared with those of the controls, it becomes apparent that measurements in both axes in pernicious anemia are greater than in controls. This apparent increase in size in the pernicious anemia nuclei falls just short of the significance level for the longer axis, but is highly significant for the shorter axis.

It may be concluded that squamous cell nuclei from the mouth are abnormally large, particularly in the shorter axis, in pernicious anemia, and that they revert toward normal with treatment. In the elderly, the nuclei tend to be larger. It appears that megaloblastic anemia may not be the only condition in which abnormally large nuclei are seen.

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The so-called myoblastoma and its significance in dental practice

F. Klinge. *München.med.Wschr.* 100:437-440 March 21, 1958

Myoblastoma, a tumor probably arising from primitive myoblasts, was discovered and described about 30 years ago. It is formed from mesenchymal cells or cell rests which are of an embryonic type. Although the histogenesis of myoblastoma is unknown, it can be assumed that this tumor is associated with a degenerative process of striated muscle cells resulting from trauma.

Myoblastoma usually appears on the mucous membrane of the upper or lower jaw or on the anterior part of the tongue. The tumor is comparatively small, rarely reaching more than 1.5 cm. in diameter. The color of its surface is lighter than that of the surrounding mucosa. Myoblastoma grows slowly and is generally benign. Malignant myoblastomas are rarely encountered in dental practice; if they occur they show a tendency to recurrence after radical excision.

Treatment depends on whether the tumor is benign or malignant, which must be decided by biopsy examination. Benign myoblastomas can be treated conservatively; tumors of the malignant type, however, should be excised with an endothermy scalpel immediately after diagnosis.

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Experimentally produced "congenital" abnormalities of the jaws

Pierluigi Masi. *Riv.ital.stomat.* 19:1593-1628 Dec. 1957

The recent advances made in teratogenic research, within the framework of that branch of teratology especially concerned with experimentally produced abnormal developments and congenital malformations in the oral cavity of animal offsprings *in utero*, has enriched present-day knowledge of prenatal oral pathology.

On the basis of such knowledge, congenital malformations of the jaws can be considered as manifestations of an imperfect embryonal development caused by noxae which exerted an upsetting action at an early fetal stage. These congenital oral malformations are embryopathies even if the upsetting action is extended beyond the embryonal period.

The various extrinsic factors, mainly malnutrition and endocrine dysfunction, which cause deformations of the jaws were studied at the Dental Institute of the University of Florence, Italy. Attempts were made to duplicate these teratogenic influences experimentally.

Doses of insulin, varying from 5 to 15 units, were administered to five groups of female guinea pigs. Each group consisted of six animals with an average body weight of 695 Gm. Insulin injections started on the fourth day after cohabitation and continued for six consecutive days. No malformations of the jaws occurred in the offspring; there were two stillbirths and two miscarriages.

Doses of 4-aminopteroyl glutamic acid (Aminopterin), varying from 0.125 to 0.250 mg., were administered to two groups of female guinea pigs. Each group consisted of six animals, with an aver-

age weight of 700 Gm. Aminopterin was given from the fourth day after gestation for six consecutive days. There were 21 live births; four young animals died within 48 hours after birth. Not a single animal was free from malformations. There was micrognathia in four; congenitally deformed lower parts of the feet in four; somatic defects in three; cleft lip in two; imperfect junction of the mandibular symphysis in one; tonoclonic distortion of the facial musculature in one; anophthalmia in one, and congenital cataract in one.

The experiment has artificially reproduced congenital deformities identical with those encountered in human pathology. The causal importance of malnutritional (especially dysvitaminotic) and endocrine factors in the embryonal development of these deformities was established. A precocious disturbance of the glucidic metabolism in embryonic tissues seems to be the most likely pathogenic process.

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Tuberculosis in the region of the mouth

Eleonore Raudenbusch. *Bl.Zahnhk.,Zürich* 19:27-28 March 1958

Tuberculosis usually is transmitted to healthy bodies through the respiratory tract, and rarely by direct inoculation through the skin. The disease is acquired by inhalation of *Mycobacterium tuberculosis* from the sputum of persons with ulcerative pulmonary tuberculosis. Experimental evidence indicates that bacilli in thoroughly dried and ground sputum are infective.

The anatomic unit of tuberculosis is the specific pathologic formation known as tubercle. When tubercle bacilli lodge in oral tissue, the first reaction is an outpouring of polymorphonuclear leukocytes. The enlarged mononuclear phagocytic cells, resembling epithelial cells, are termed "epitheloid" cells, and assume a radial arrangement around the site of infection. Among them appear the giant cells of tubercle, designated as Langhans' cells. These cells differ from the giant cells formed by foreign-body reaction in their characteristic arrangement of nuclei. In the normal course of development, a specific type of necrosis occurs which is termed "caseation" because of its cheeselike appearance.

Tuberculosis of the jaws is comparatively rare; if it occurs it affects the oral mucosa and forms a peripheral lesion in the jaw; regional lymph nodes may be involved and enlarged.

Tuberculous abscesses in the oral cavity do not heal satisfactorily when treated by incision. Drainage should be suspected and checked by histologic examination. The variability of tuberculous lesions in the oral cavity makes clinical recognition difficult, and often only by means of biopsy is it possible to differentiate between tuberculosis in the oral cavity and primary syphilis, uncomplicated hypertrophies and carcinomas. Tuberculous lesions in the mouth usually are discovered by the dentist before the pulmonary condition has become evident.

Tuberculosis involves the tongue more frequently than other parts of the oral cavity. Extensive oral involvement by the diffuse or osteomyelitic type of tuberculosis is more serious than other types. Sometimes the upper jaw in the infraorbital region is affected, where cold abscesses may form. The lower jaw, however, is more frequently involved than the upper jaw.

Approximately only 1 per cent of clinically recognizable instances of tuberculosis appears in the oral cavity. These instances represent implantation of *Myco. tuberculosis* discharged into the blood stream from a tuberculous focus.

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Allergic reaction to lipsticks: report of case

E. Fuchs. *München.med.Wschr.* 100:504 March 28, 1958

The patient, a 17 year old girl, came to the dental office for periodic examination. Although she was in seemingly perfect general health, her oral mucosa was covered by a network of intense pearly white discolorations and spots showing a diffuse opacity of bluish tint. The lesions were sharply outlined, without palpable induration, and appeared as if they were pasted on the mucous membrane.

The patient's history and that of her family gave no evidence of dermatoses or idiosyncrasies,

except allergic reactions appearing after the use of lipsticks. Several brands of lipsticks were tried, all causing similar reactions and urticaria.

Treatment consisted of elimination of the cause of the allergen (lipstick) and the administration of comparatively high doses of cortisone acetate.

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Progressive internal resorption in permanent teeth

H. P. Berning and F. L. Lepp. *Cienc.y Cult.* 56:49-53 Dec. 1957

Internal resorption in permanent teeth may take place within pulp chambers or root canals, and is capable of destroying comparatively large parts of crowns and roots. This resorption process is of an idiopathic type, and its causative factors are unknown.

External (lateral) resorption in permanent teeth, produced by pressure—for instance by orthodontic appliances—usually is compensated by the formation of secondary cementum immediately after the pressure is removed.

Dysfunction of the endocrine glands, including hyperthyroidism, may produce internal resorption in the permanent teeth of persons who have never been subjected to orthodontic or endodontic treatments.

Idiopathic root resorption occasionally decomposes the roots completely, and because of its undetermined etiology, no adequate treatment is known.

In the diagnosis of internal resorption processes in permanent teeth, the following types should be considered: (1) centrifugal, progressive and symmetric resorption, usually beginning in the pulp cavity, and (2) centripedal, progressive and asymmetric resorption, beginning in the periodontium and gradually advancing to the dentin and cementum.

Root resorption in permanent teeth occurs in about 1 per cent of patients who previously were not subjected to endodontic or orthodontic treatments, but in 75 per cent of patients after such treatments.

Previously, many probable causative factors have been blamed for the occurrence of this phenomenon such as dietetic disturbances, endocrine imbalances, systemic conditions, anatomic abnormalities, shape and size of teeth and roots, and susceptibility of the tooth substances to lytic and phagocytic actions.

Bone and cementum show a morphologic, physiologic, pathologic and chemical similarity. Bone will be resorbed if it is subjected to pressure in a direction to which it normally would never be subjected. Cementum will be resorbed by any pathologic process which becomes evident whenever the physiologic limits have been surpassed by pressure or when the pressure is exerted in a direction at a right angle to the long axis of the tooth.

Idiopathic resorption, occurring independently of previous endodontic or orthodontic treatments, may be caused by the forces of occlusion not being in line with the long axis of the tooth.

Unless progressive internal resorption can be produced experimentally, the task of determining the etiologic factors is extremely difficult.

Histopathology and roentgenography, however, may aid in developing new methods of diagnosis and differential diagnosis.

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Oral lesions accompanying pachyonychia congenita

Robert J. Gorlin and A. P. Chaudhry. *Oral Surg., Oral Med.& Oral Path.* 11:541-544 May 1958

Pachyonychia congenita is an unusual congenital and sometimes familial malady characterized by dystrophic changes in the fingernails and toenails, hyperkeratoses or callosities of the palms and soles, follicular keratosis of the acneiform type particularly about the knees and elbows, and hyperhidrosis or excess sweating of the hands and feet. Dystrophic changes also are observed occasionally in the hair or cornea. Oral lesions are nearly always present, in the form of white opaque thickenings. These thickenings may involve only a portion of the buccal mucosa or tongue, or they may be generalized, covering the entire mucosa of the tongue, lip and cheek. Angular cheilosis commonly is present.

A white girl was first seen at the University of Minnesota Hospital when she was less than two years old. At that time, her condition was diag-

nosed as pachyonychia congenita, on the basis of her deformed darkened fingernails and toenails and a rash limited to her lower legs. When the patient was about 18 months old, a scaly, papular rash appeared on the knees, elbows and buttocks. Subsequently she developed bullae on the feet, callosities on the palms and soles, and hyperhidrosis.

Oral examination at the age of 17 revealed white thickenings bilaterally on the buccal mucosa, especially along the interdental line, and a diffuse, white covering of the tongue, especially along the lateral margins. Two small whitish plaques in the interarytenoid region were responsible for a mild, husky voice change.

Microscopic examination of the oral mucosa from the tongue and buccal surfaces revealed identical changes. The epithelium was acanthotic with a uniform intracellular vacuolization throughout all the involved epithelium. The intercellular bridges in the prickle-cell layer were missing. There was pronounced parakeratosis and the stratum granulosum was absent. A Schiff stain did not reveal any Schiff-positive material within the epithelium.

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Chronic intermittent recurrent aphthae: report of case

Hanns Baur. *München.med.Wschr.* 99:1792 Nov. 22, 1957

Although chronic intermittent recurrent aphthae in the oral cavity, the lips and the tongue, are seen comparatively often in dental practice, their cause remains obscure. This condition may appear at any age, though it occurs more frequently in adolescents or young adults than in older persons, and far more often in women than in men.

Many authors have attributed this condition to glandular disturbances, others to allergic manifestations.

Sometimes the exciting factor is a comparatively mild irritation. An unspecified virus may be the causative agent.

In the case reported, the patient, a 45 year old woman, showed aphthous ulcerations of the mouth, especially of the tongue, which appeared, disappeared and reappeared at various stages. There was an intraepithelial edema in the stratum granulosum but no periodontal disease or aphthous stomatitis. The patient's children showed similar manifestations.

After consultation with the patient's physician, the initial treatment consisted of prescribing a diet rich in vitamins (especially vitamin B complex and ascorbic acid) and oral administration of antihistamines. Because of the possibility that the condition could be a unique form of a viral allergy, influenza viral vaccine also was used.

Special attention was given to the patient's oral hygiene. A mild astringent mouthwash was prescribed.

After one month's treatment, the condition seemed to be arrested, and after more than six months, there was no recurrence.

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Stevens-Johnson syndrome

D. A. Sher. *Minnesota Med.* 41:32-34 Jan. 1958

Stevens-Johnson syndrome, a variety of erythema multiforme exudativum, was observed in a ten year old girl. Physical examination revealed a toxic, dehydrated and acute condition. The temperature was 40.8°C. (105.4°F.) The pulse was rapid, and the patient was restless. There was a generalized, widely spread rash. The oral mucosa was ulcerated, and conjunctivitis was present.

The patient was given penicillin, erythromycin (Ilotycin) and parenterally administered fluids. Her condition became progressively worse during the next two days. The buccal mucosa showed an ulcerated surface causing gradual disintegration and necrosis. Considerable sloughing was noted. The tongue was severely coated. The tonsils exuded a grayish matter and the pharynx was swollen. The posterior lymph nodes were palpable. A generalized papular, macular and vesicular eruption was present on the skin; large bullae were observed on the face and other regions of the body. Slight pressure over the lesions caused superficial peeling of the skin, leaving a violet-red raw surface.

Penicillin and erythromycin were withdrawn, and the patient was given 20 mg. of corticotropin (ACTH) every six hours and 100 mg. of tetra-

cycline (Achromycin) every eight hours. Ten per cent dextrose by continuous drip, vitamin B complex and vitamin C were administered. There was a notable response to this therapy.

Administration of corticotropin and tetracycline was continued for ten days with a gradual decrease in dosage. The skin lesions and ulceration of the mucous membrane cleared rapidly. The patient was discharged 15 days after the start of treatment.

Stevens-Johnson syndrome is characterized by a variation in skin reactions, involvement of the oral mucosa, severe ophthalmia and serious general reactions. The cause of the syndrome has not yet been determined.

The lack of biologic symptoms, the ineffectiveness of antibiotics alone, and the notable effect of corticosteroids seem to indicate an allergic base for the development of this syndrome. The disease is self-limiting and variable in its course. Because sensitization may play a significant role, the combined administration of antihistamines and adrenal steroids is recommended for treatment. Antibiotics, except those with possible sensitizing properties, should be given to control secondary bacterial invaders. Supportive therapy is essential because of the severity of the disease.

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Hemorrhagic diatheses caused by abnormal platelet function

K. H. Schäfer, K. Fischer and G. Landbeck. *Deut.med.Wschr.* 83:756-760 April 25, 1958

The role platelets play in blood coagulation and hemostasis was investigated at the Pediatric Clinic of the University of Hamburg, Germany.

Hemorrhagic diatheses due to an abnormal platelet function occasionally are hazards in routine dental or surgical practice.

The Coomb's test was used to determine the presence of antibodies in the blood and to detect sensitized red cells or hemolytic syndromes. In addition to the usual cytologic and coagulating tests, the activity of platelet factor III was determined and recorded.

The important data for the differential diagnosis of essential thrombopenia (12 patients), thrombopenia of known etiology (17 patients) and hereditary thrombopathy (26 patients in 15 families) were established. The determination of platelet factor III, the direct Coomb's test, the establishment of recalcification time, clot retraction time and prothrombin consumption time provided the best information for diagnosis. In instances in which the last three tests were abnormal because of the presence of thrombopenia, the likely diagnosis was purpura haemorrhagica (Werlhof's disease). This diagnosis was verified by the consistently negative Coomb's test and a decrease in the activity of platelet factor III.

In thrombopenia of known etiology (including allergic antibodies), the test results were normal, the clot retraction time only slightly increased and prothrombin consumption time either normal or slightly abnormal.

The direct Coomb's test proved to be important where it was necessary to differentiate between purpura haemorrhagica, hemorrhagic diathesis due to thrombopenia and a comparatively rare mixed form.

A case is reported of an eight year old boy with an inherited (familial) thrombocytopenic hemorrhagic diathesis. The direct Coomb's test at first was positive and the activity of platelet factor III decreased. This indicated that the thrombopenia, caused by heterogenic antibodies, was superimposed on a familial hemorrhagic diathesis. The formation of these antibodies had apparently been precipitated by a coincidental development of Hodgkin's disease.

This case report, probably unique, shows the necessity for a new classification of thrombopenias based on pathogenetic and (whenever possible) etiologic findings.

Universitäts-Kinderklinik, Hamburg-Eppendorf, Germany

Focal infections involving the maxillary sinus

H. Richter. *München.med.Wschr.* 100:477-478 March 28, 1958

The theory that acute localized infections in the oral cavity may cause abscesses in adjacent fascial spaces and produce systemic disease in distant regions of the body has been readily accepted by some authors and vehemently denied by others.

The principle that low-grade, chronic dental foci of infections—even though they exhibit no clinical symptoms—influence general health is universally accepted by both medicine and dentistry.

Pus discharged into the mouth from gingival pockets or through fistulas from acute or chronic tooth abscesses may reach the pharynx and the lungs during normal breathing. Secondary infections may occur, especially in patients who habitually breathe through the mouth. Bacteria may be carried from the mouth to the bronchi and lungs either in moisture globules or attached to inhaled pieces of calculus. Occasionally, particles of filling material, fractured parts of a tooth, or whole artificial or extracted teeth are inadvertently aspirated.

There exists a direct connection between periodontal disease and secondary infection of the bronchi or lungs.

Anesthesia in dental practice increases the hazard of aspiration of infected substances.

Seventy-eight patients with toxic symptoms of secondary focal infection have been cured by surgical clearance of the maxillary sinuses, during the period from 1950 to 1957.

The primary focus of infection, however, was sometimes detected several years after the initial phase because it was located in the oral cavity without producing pathologic symptoms. It existed there for a comparatively long time "concealed" in the form of a chronic hyperplastic inflammation which frequently originated from impaired teeth (which were inadequately treated).

Prior to treatment of patients in whom focal infection is suspected, blood cell sedimentation tests should be made to establish whether dental foci of infection are present, and if so whether they have exerted systemic effects.

In all unclear instances of focal infection, especially when the management of impaired teeth shows no success or when tonsillectomy is indicated, attention should be paid to the possible relation between dental foci and somatic disease. In many instances the secondary infection is so well established and the damage already irreparable that an eradication of the focus will have little effect, except that it may improve the general resistance.

Karlstrasse 10, Augsburg, Germany

Oral and laryngeal cancer caused by the occupational inhalation of harmful substances

H. Blümlein. *München.med.Wschr.* 99:1333-1335 Sept. 13, 1957

Cancer of the oral cavity and the larynx has become the most frequent cellular tumor in the fields of oral surgery and otorhinolaryngology.

Especially in men, carcinoma and sarcoma—either as primary or secondary tumors—show in these regions the same increasing incidence as does cancer of the lung.

At the Dental School and the Otorhinolaryngologic Clinic of the University of Erlangen, Germany, the collected data of 300 patients with these types of cancer were studied. Patients' histories, environmental influences and experiences, abnormal sensations, emotions and acts and occupational hazards were recorded and evaluated.

It seems that the inhalation of tobacco tar during smoking of cigarettes plays a significant role in the development of oral and laryngeal cancer. Increase in cigarette smoking, observed all over the world, is paralleled by an increase in the incidence of malignant tumors of the oral cavity, the larynx and the lungs. Prolonged inhalation of hot air and harmful chemical substances, however, appears to be the main factor in the etiology of these cancer types.

Fifty-three patients had a history of occupational exposure to extreme heat. They were stokers, locomotive engineers, blacksmiths, glass blowers, bakers and workers in iron foundries, steel mills or chemical industries.

It is recommended that an occupational history be obtained from every patient with cancer of the oral cavity or the respiratory tract, and that these case histories contain data covering the entire life of the patient. Such an investigation will reveal epidemiologic and exogenous carcinogenic factors of human cancer which sometimes are traceable over several decades.

Dentists share a major part of the responsibility for early recognition of oral cancer because many patients with suspicious lesions in or about the mouth prefer to consult the dentist and not the physician.

Universitätsklinik für Hals-, Nasen- und Ohrenkrankheiten, Erlangen, Germany

Endodontics

A temperature analysis of thermostatically controlled root canal sterilizers using molten metal, glass beads, or salt

Seymour Oliet, Solomon Sorin and Harry Brown. *Oral Surg.,Oral Med.& Oral Path.* 11:37-42 Jan. 1958

Electric sterilizers, thermostatically controlled, using molten metal, extra fine glass beads, or salt, have been reported clinically effective within ten seconds against all forms of microorganisms commonly found in infected root canals. A study was initiated to analyze the temperature gradients found at different horizontal and vertical positions in a Union Broach glass bead sterilizer, an Esquire glass bead sterilizer, and an Esquire molten metal sterilizer, and to determine the heat-conducting ability of the molten metal, glass beads, and salt.

The order of efficacy of heat conduction appears to be, in descending order: molten metal, salt, and glass beads.

Salt has several practical advantages over molten metal and glass beads: (1) blockage of canals is eliminated due to salt's solubility; (2) salt forms no dross and requires no antiflux; (3) salt will not spill as readily, or, if it does, it is more likely to scatter than to adhere to an object, and (4) it is easily obtained at minimal cost.

A gradient of temperature exists between the base and the surface of all sterilizers, and between the outer circumference of the well and the center of the well in sterilizers using solid heat-conducting media.

The substitution of salt or glass beads in wells designed for molten metal appears to be contraindicated unless a temperature of about 425° to 475° F. can be attained.

A narrow deep well is preferable to a wide shallow well when solid heat-conducting media are used in a thermostatically controlled sterilizer.

Instruments to be sterilized should be inserted as deep as possible near the sides of the wall when solid heat-conducting media are used.

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Pyribenzamine as a chemotherapeutic agent in endodontics

L. Irving Epstein. *New York State D.J.* 24:37-38 Jan. 1958

In two groups of patients, those with painful, pulp-involved, vital anterior teeth and those with nonvital anterior teeth with pericementitis, the antihistaminic agent tripelennamine hydrochloride was evaluated as a means of controlling patient discomfort after endodontic procedures.

In the first study, vital pulpectomies were performed on the maxillary anterior teeth of 25 patients. Fifty milligram tablets of tripelennamine hydrochloride were dispensed to each patient with instructions to take one tablet every six hours. Placebos were given to a similar group of control patients. Nineteen of the 25 patients in the experimental group had no pain during the first 24 hours, whereas in the control group only 4 out of 25 had no pain.

In the second study, 20 patients were treated with 50 mg. of tripelennamine hydrochloride every six hours and 20 patients in a control group were treated with a placebo every six hours. Seventeen out of 20 patients in the experimental group obtained relief from pericementitis, whereas in the control group only 11 of 20 patients obtained relief.

Patients who received tripelennamine hydrochloride showed substantially less swelling, more rapid healing and greater postoperative comfort. A tranquilizing effect was noted in about 20 per cent of the patients, and of these, a few became drowsy. Where drowsiness occurs, the patient is instructed not to drive a car or engage in any hazardous work.

Tripelennamine hydrochloride frequently is effective in controlling discomfort after endodontic procedures, since it reduces edema and pain and helps to hasten healing.

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Anesthesia and analgesia

Jet injection local anesthesia in dentistry: a report of 66 cases

Peter M. Margetis, Edward P. Quarantillo and Robert B. Lindberg. *U.S.Armed Forces M.J.* 9:625-634 May 1958

Jet injection is the term given the principle of injecting fluids into the skin and mucous membranes by forcing liquid substances through small openings or jets at high pressure. An investigation was undertaken to determine the feasibility of using jet injection to produce local anesthesia for such routine dental procedures as cavity preparation and tooth extraction.

The injectors used were single-shot, hand-operated, spring-loaded instruments produced by R. P. Scherer Corp., Detroit, Mich. They are 21 cm. long and 4 cm. in diameter. The jet injector is an interconnected, two-part instrument. The front part contains the metal ampule of material to be injected (Metapule). The back part contains the power source, a spring-activated plunger which contacts the stopper at the rear of the Metapule with sufficient force to drive the solution ahead of the stopper through the orifice of the Metapule (Fig. 1, left). The only modification of the injector for dental use was to extend the tip to a length of 2 inches (Fig. 1, center). The injector contains six springs which are energized by compression through a screw and nut principle (Fig. 1, right).

The solution in the Metapule is hermetically sealed in an aluminum container under aseptic conditions. At the conical end of the Metapule is a minute orifice through which the jet of liquid is expressed. The usual technic of preparing the site for injection is observed.

Sixty-six patients, ranging in age from 10 to 37 years, were used for this study. Each patient received from one to four injections. The types of injections successfully administered were infiltration, conduction and block anesthesia. The operative procedures successfully accomplished were the removal of caries and the preparation of cavities of all classes in both anterior and posterior teeth in both arches. The surgical procedures successfully completed were the extraction of anterior and posterior teeth in both arches.

The technic of making the injection did not differ greatly from the established technics in which a needle was used. The same "puncture sites" were selected, care being taken that the column of liquid entered at a right angle to the area being injected. The orifice sizes varied from 0.005 to 0.008 inch. The amount of solution used was 0.6 ml. per injection, although successful injections were made using 0.3 ml. The anesthetic used was lidocaine hydrochloride with epinephrine 1:100,000 or 1:50,000. The instrument was disinfected by removing the tip, washing it with soap and hot water, then placing it in benzalkonium chloride.

The most striking observation was that the 66 patients denied any feeling of pain during the injection. Extractions and cavity preparations were successfully accomplished in 87 per cent of all instances; 13 per cent were unsuccessful due to insufficient anesthesia; in this latter group, additional injections had to be made to permit successful completion of the procedure.

In 13 per cent of the injections, moderate to heavy bleeding occurred. This was controlled easily by holding a 2 by 2 inch sterile gauze pad with pressure over the puncture site for one to two minutes. Generally, the larger the orifice, the greater was the tendency to laceration and bleeding. In a few instances, tenderness at the site of injection persisted for from 24 to 48 hours.

Dental local anesthesia of sufficient depth and duration to complete routine operative and surgical procedures is feasible utilizing the jet injection principle. Jet injection has the following advantages: (1) no discernible injection pain; (2) less danger of transmitting infectious hepatitis; (3) no hazard of needle fracture during injection; (4) ease of sterilization, and (5) no psychic trauma such as may occur with needle injections.

Disadvantages are the high incidence of bleeding at the injection site, and the cost of the jet injector and the Metapules. The results of this

Figure 1 Left: Jet injector. Center: Jet injector modified for dental use. Right: Cross section of jet injector showing plunger (top), springs (middle), and screw and nut (bottom)

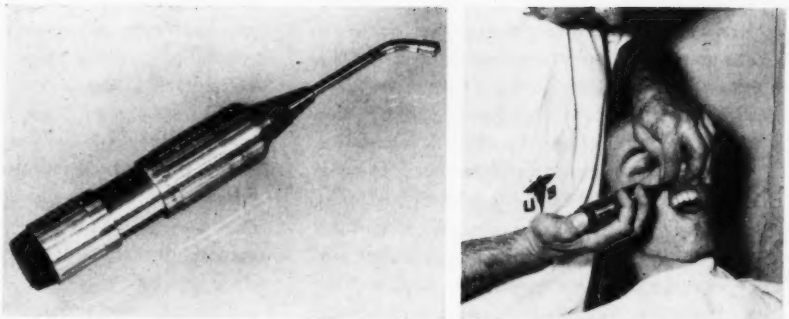

Figure 2 Left: Jet injector with dental tip in place, designed for use in studies to determine the optimal orifice size and spring pressure. Right: Use of experimental jet injector

study warrant further investigation to determine the optimal orifice size and spring pressure for a jet injector designed specifically for use in dentistry. An injector with which these factors could be determined has been designed and is shown in Figure 2.

Office of the Surgeon General, Department of the Army, Washington, D.C.

Anesthesia of short duration in the dental office

E. Seifert. *München med.Wschr.* 100:542-545 April 4, 1958

Only anesthesia of short duration is practicable for routine work in dental offices. Because the time limits of dental procedures necessitating anesthesia cannot be standardized, the question "How long should anesthesia be maintained?" arises. The only proper answer is: "Long enough to permit completion of the intervention."

No one can expect that the anesthetic effect will be terminated at exactly the same moment the dental procedure is complete. The dentist, therefore, should select an anesthetic agent which permits the desired duration plus an additional 30 minutes for possible, unforeseen delays.

In selecting the anesthetic agent, the dentist should consider the following important factors: (1) induction time; (2) depth of anesthesia; (3) duration of anesthesia; (4) return of sensation; (5) absence of side reactions, and (6) occurrence of postanesthetic pain. Other factors, such as the drug's stability, pH level, isotonicity, spread, penetration, shelf life and costs, are of minor importance. The use of strongly toxic or irritant anesthetic solutions should be avoided for anesthesia in the dental office, which is not the proper place for experimentation.

There are patients who are difficult to anesthetize because they are extremely resistant to anesthesia of short duration. Some dentists will feel a temptation to use routinely the more toxic anesthetic solutions. There are, however, potent and comparatively nontoxic anesthetics available, the use of which will enable the dentist to avoid any hazard.

The importance of estimating the time required to complete the operation and the length of time that the anesthetic will remain in effect, and of evaluating the patient's possible reaction to the anesthetic agent selected, cannot be overemphasized.

The dentist should have available at his office at least three anesthetic solutions: (1) for brief anesthesia; (2) for profound (prolonged) anesthesia, and (3) for anesthesia in patients such as those afflicted with myocardial insufficiency, rheumatic or congenital heart diseases, thyrotoxicosis, diabetes, allergies and neuropathies.

Untoward reaction to anesthesia may be avoided by evaluating the patient's medical history and physical condition.

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Levallorphan and meperidine in anesthesia: study of effects in supplementation of nitrous oxide-oxygen-thiopental sodium anesthesia

Francis F. Foldes and Kamil H. Ergin. *J.A.M.A.* 166:1453-1458 March 22, 1958

Meperidine hydrochloride is widely used to supplement nitrous oxide-oxygen-thiopental sodium anesthesia, because its use reduces considerably the patient's requirements for thiopental sodium. A study was undertaken to determine if the conjoint administration of levallorphan and meperidine hydrochloride would permit the amount of meperidine hydrochloride to be increased and thus effect a further saving of thiopental sodium.

The results in a series of 501 patients thus managed were compared with the results in a control series of 462 patients in whom nitrous oxide-oxygen-thiopental sodium anesthesia was supplemented by meperidine hydrochloride alone.

In general, the patients in the experimental group were given a levallorphan dose of 0.02 mg. per kilogram of body weight, and this was followed three to six minutes later by 2 mg. per kilogram of body weight of meperidine hydrochloride (1:100 ratio). In aged and debilitated subjects these inital doses were reduced by a third or a half.

The combined use of levallorphan and meperidine made it possible to employ larger doses of the latter drug and thus to decrease the amounts of thiopental sodium required.

Levallorphan afforded excellent protection against respiratory depression from the large doses of meperidine hydrochloride used. The reactivity of the patients at termination of surgery was about the same in both series. When levallorphan was used in combination with alphaprodine hydrochloride, postoperative recovery was more prompt than when levallorphan and meperidine hydrochloride were employed. Therefore, if one aims at rapid recovery from anesthesia, the former combination is preferable.

It is concluded that levallorphan protects against meperidine-induced respiratory depression just as well as it does against such depression from alphaprodine (Foldes and others, 1956).

Pride and Locust Streets, Pittsburgh 19, Pa.

The use of polyvinylpyrrolidone iodine as an oral antiseptic

James M. Jablon, Doran D. Zinner and Milton S. Saslaw. *Bact.Proc.* 87, 1958

The abundant flora of the mouth present a hazard of infection whenever injection through the oral mucosa is necessary. During injection, microorganisms are sucked back into the anesthetic cartridge. Streptococci, staphylococci, gram-positive and gram-negative bacilli and yeasts have been recovered from the injecting needle and the anesthetic cartridge. The preparation of the injection site with local antiseptics reduces the hazard of infection but does not eliminate it.

An investigation was undertaken in an attempt to reduce further the hazard of infection by the use of povidone-iodine (polyvinylpyrrolidone iodine). Polyvinylpyrrolidone is a plasma protein substitute and is combined with iodine so that free iodine is liberated slowly. In 10 per cent concentration the solution contains 1 per cent free iodine and does not sting, burn or stain. In vitro tests, with a modification of the phenol coefficient technic, have shown that dilutions of up to 1 to 400 of the 10 per cent aqueous solution were highly effective in killing, within 15 seconds, the organisms commonly present in the mouth.

In in vivo tests, when the 10 per cent solution was used to prepare the gingiva for local injection, the hazard of direct infection was removed almost completely. The results of the present study show that, after use of the solution, cultures of the contents of the hypodermic needle and of the anesthetic cartridge have remained sterile, even after three days of incubation at 37° C.

National Children's Cardiac Hospital, Miami, Fla.

Anesthesia in children

H. Neiditsch. *Helv.chir.acta* 24:47-49 Dec. 1957

Endotracheal anesthesia is the recommended method for children regardless of their age. Premedication with morphine, atropine or pentobarbital sodium obtains a soporific effect at the time anesthesia is initiated.

Induction of anesthesia in children is brought about by nitrous oxide-cyclopropane through a face mask, and is followed by oxygen-cyclopropane at a rate of 600 to 400 ml. per minute. Ether may then be added in increasing amounts.

When anesthesia is sufficiently deep (usually after seven minutes), the child is intubated with the largest tube that will pass the glottis easily. The tube is connected with the apparatus by a one-way Digby-Leigh valve. Anesthesia is maintained with oxygen-nitrous oxide ether. Every second inspiration should be supported by pressure on the breathing bag. Prior to any type of surgery in children, in which anesthesia is required, the stomach should be emptied with a gastric tube.

Pulse and blood pressure reading must be taken every five minutes. In operations on any part of the head, oral cavity or neck, the endotracheal tube should be connected with an Ayre "Y" piece.

For minor oral surgical procedures in children, the open-drop ether technic is still the safest method. Trichloroethylene combined with nitrous oxide and oxygen gives adequate light anesthesia for most oral surgical interventions. Basal rectal anesthesia is indicated if complete immobilization is desired, as for instance when roentgenotherapy is to be utilized.

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Public health dentistry

The Evanston dental caries study. XVIII. Report on the permanent teeth dental caries experience rate of the children in the control area (Oak Park, Illinois)

I. N. Hill, J. R. Blayney and Walter Wolf. *J.A.D.A.* 56:688-691 May 1958

The dental caries experience rates of the permanent teeth of 2,051 children, 6, 7, 8, 12, 13 and 14 years old, examined in the fluoride-free control village of Oak Park, Ill., in 1947, are compared with the results of 2,537 dental examinations made nine years later in the same community. Originally it had been planned to re-examine the children of the control area in 1958, but the program was altered when it became known that fluoride would be added to the water supply of Oak Park in August 1956.

The DMF rates observed in 1947 and in 1956 were remarkably close in view of the nine year period between examinations. At age six the DMF rates per 100 children for the two years were 26.89 in 1947 and 22.54 in 1956; at age seven, 102.63 and 128.71, respectively, and at age eight, 222.44 and 242.55, respectively. The children 12, 13 and 14 years old had only minute differences between the 1947 and 1956 rates.

There being no statistically significant change in the dental caries experience rates over a nine year period, no adjustment was made in the rates in Evanston, the experimental area. It is concluded that the reduction in the dental caries experience rates of the children of Evanston, Ill. (*Dental Abstracts* 2:694-695 Nov. 1957), is due solely to the sodium fluoride in the Evanston water.

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The role of psychologic predisposition in dental cavity formation

J. H. Manhold, Jr. *J.D.Res.* 37:330-334 April 1958

A study was undertaken to attempt to delineate more clearly those factors of personality associated with the formation of dental caries through neglect of oral hygiene, and to attempt to test further the author's formulation of a dichotomous hypothesis for psychosomatic disease processes (1956).

The subjects consisted of 1,019 naval aviation cadets and 311 naval retrainees. The systems of measurements employed were the DMF surface index of dental caries and the Pensacola Z Scale. This scale is a new psychologic instrument which purports to measure attitudes of personal autonomy and heteronomy. These attitudes are similar to the authoritarian-nonauthoritarian attitudes measured by the California F scale, but are said to be purer measures of a type of personality.

A definite difference exists between the cadet and retrainee groups with respect both to dental health and to the facets of personality measured.

The stronger are the individual's tendencies toward heteronomy, that is, the more anxious, rigid and hostile he is, the higher his dental caries rating appears to be.

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Engineering aspects of communal fluoridation

Harry E. Jordan. *Bul.Am.A.Pub.Health Den.* 18:30-35 March 1958

After the initiation of fluoridation in 1945, the American Water Works Association took note of this change in water works practice; in January 1949 it appointed a committee to draft a statement of policy. In May 1949 the committee submitted its report to the A.W.W.A. board of directors. The report, which was approved, contains this key paragraph: "In communities where a public demand has developed, and the procedure has the full approval of the local medical and dental societies, the local and state health authorities and others responsible for communal

health, water departments or companies may properly participate in a program of fluoridation of public water supplies." Not a word of this statement of policy has since been changed. It advises the members of the association to follow willingly and intelligently professional advice whenever the public authorities have approved the procedure. The association concerns itself with the engineering aspects of fluoridation.

As of September 1, 1957, 798 water systems serving 1,532 communities with a population of 32,319,603 were using water with controlled fluoridation. No change in technical procedures affecting the public has been effected so promptly.

Three principal materials—sodium fluoride, sodium silicofluoride and hydrofluosilicic acid—are used in the fluoridation of public water supplies. The first two are granular powders and the third is a liquid which can be used only in plants within reasonable trucking distance of the place where the material is produced.

There is nothing involved in the handling of fluorides that is uncharted territory for the water works operators. Modern water treatment involves the use of many materials. Fluoridation has not required the development of any new pieces of equipment. Many people erroneously believe that fluoridation involves the use of unfamiliar materials and equipment by water works men.

Opponents of fluoridation have asserted that the addition of fluoride to public water supplies eats up the water mains. This is untrue. Fluoride may corrode equipment in the water works plant unless the water works man takes the ordinary precaution of occasionally flushing the connections in the piping system. Chlorine is far more harmful than fluoride in its corrosive effects.

The A.W.W.A. has spent a great amount of time investigating the effects of fluoridated water on commercial and industrial operations. No instance is known in which a commercial process has been affected adversely by the use of fluoridated water. Among the industries investigated are the following: soft drink production, brewing, plating, steam generation, textile operation, fruit canning, candy production, baking, corn products processing, photograph development, meat processing, rubber goods manufacturing, laundering, distilling, peanut and cotton oil production, sea foods, malt liquors, pickle packing, ice cream production, tobacco processing, canning, drying fruits and vegetables.

American Water Works Association, 2 Park Avenue, New York 16, N.Y.

Decalcification in initial caries

F. von Bartheld. *Tschr.tandheelk.* 65:76-89 Feb. 1958

Decalcification of the enamel in initial caries was the object of a study made at the department of sosiodontia (operative dentistry) of the University of Groningen, the Netherlands.

Carious decomposition begins in characteristic regions of the enamel surface and becomes visible as a white opaque spot. No perceptible loss of tooth substance occurs. The opacity, however, extends slowly into the deeper enamel layers until it has reached the dentin which is subsequently attacked.

Carious decomposition of the dentin usually occurs after the bony layers which normally cover the roots have become exposed.

In initial caries, the normally translucent enamel appears porous and opaque, chalky white by incident light and dark brown by transmitted light. Roentgenographic examination reveals that a partial demineralization of the enamel structure has taken place which obviously is caused by processes of dissolution and diffusion. Examination of specimens under polarized light will verify the roentgenographically-determined effect.

Leber and Rottenstein ascribed this partial decomposition of enamel to the combined action of acids and microorganisms. Miller and Black introduced the chemicoparasitic theory of caries etiology according to which caries is caused by a combined chemical and bacterial action, the acids being only intermediary products of the microbial metabolism.

Donnan's equilibrium theory states that when two solutions are separated by a membrane which is permeable to some of the ions, the product of the concentration of diffusible ions on one side of the membrane must be equal to the product of the concentration of similar ions on the other side.

In the study of the decalcification process in initial caries, Donnan's theory was tested.

Enamel can be regarded as a water-containing gel of a dense structure. In its normal environment it contains hydrogen and hydroxyl ions almost equally distributed. Because of density in structure, enamel admits small molecules and ions from the oral fluid, but it is impenetrable by macromolecules such as proteins and carbohydrates. According to Donnan's theory, enamel can be considered as a membrane, and simultaneously as one of the compartments, the other being the oral cavity. The fluid bathing the tooth surfaces may be a film of saliva or the liquid contents of bacterial plaques.

In the immediate proximity of the enamel surface is a solution of positively charged ions which cannot diffuse into the enamel. Even if this ion-containing solution is near the neutral point, an ionic distribution will take place, confirming Donnan's equilibrium theory. The saliva becomes slightly alkaline and in the enamel a sudden drop in pH occurs. The enamel excretes hydroxyl ions in exchange for small anions. The buffering action and the saliva flow remove the hydroxyl ions, thereby increasing the acidity in the enamel. An increasing excess of hydrogen ions develops, the enamel becoming decalcified under conditions that are exactly opposite to the decalcification by immersion of a tooth in an acid.

This particular kind of decalcification in the enamel is responsible for the development of the characteristic white opaque spots in initial caries.

The only compound always present in the oral cavity that is able to cause Donnan's ionic distribution between enamel and saliva consists of ionized protein molecules. All other substances in solutions are either too small (inorganic salts and enzymatic acids) or not ionized (carbohydrates and their degradation products).

It can be concluded that initial caries of the enamel results from Donnan's ionic distribution, dependent on the presence and concentration of positively charged protein ions and not on the presence of free acids.

Important factors in the etiology of caries are: (1) the acid production rate; (2) the average isoelectric point, and (3) the concentration of protein or proteins.

Donnan's equilibrium theory takes into consideration the protective action of saliva on enamel, its ionized protein being negatively charged at pH values above the isoelectric point.

In caries-resistant persons the pH on enamel surfaces varies between seven and the average value of the isoelectric point of proteins present. The pH value cannot drop below the isoelectric point because of the low acid production rate, the low average isoelectric point of proteins, the high protein concentration, the high rate of drainage, the adequate buffering capacity and the strong alkalizing Donnan effect.

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The effect of 0.025 and 0.0125 per cent dietary sodium fluoride on the rat kidney

J. J. Pindborg. *ORCA* 4:177-180 1957
[in English]

Sixty-two white rats of the Wistar strain were given a diet containing 0.025 per cent sodium fluoride for periods ranging from one to nine weeks. Sixty-three other white rats were given 0.0125 per cent sodium fluoride in the diet for periods ranging from 2 to 18 weeks.

In none of the rats were any histologic changes observed in the kidneys which could be attributed to the effect of fluoride.

In a previous paper the author had shown that feeding rats a diet containing 0.05 per cent sodium fluoride caused histologic changes in the kidneys after from 21 to 28 days on the diet.

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The nonacid agents in the caries pathogenesis and their relation to the prophylaxis

H. Eggers Lura. *ORCA* 4:169-176 1957
[in English]

It is generally accepted that refined sugars play an important role in caries pathogenesis, and that an accumulation of sugars on the tooth surface will cause the initial carious attack. Although for more than half a century the cariogenic effect of the sugars was ascribed exclusively to their acid forming faculty, most of the caries tests which lean on the acid activity have been shown to be questionable when applied to clinical observa-

tions. A lot of facts have been observed which are incompatible with the Miller theory of caries. Persons whose oral flora has a great oxygen uptake and who are caries-free often will be the strongest acid formers.

The oxygen uptake of the salivary microflora appears to constitute a reliable caries test which correlates well with the clinical observation of caries.

There are three nonacid mechanisms which, either singly or in cooperation, are able to dissolve the tooth enamel at neutral pH. These mechanisms are: (1) the bacterial keratinolysis which attacks the organic compounds of the enamel; (2) the bacterial, synthetizing phosphatase effect which attacks the phosphate of the enamel, and (3) the chelation mechanism which attacks the calcium and the other metals of the enamel. All these caries mechanisms can be activated by the presence of refined sugars.

If the aforenamed nonacid reactions turn out to be the mechanism of caries pathogenesis, there is no logic to the present caries prophylactic measures. It is of no use to neutralize the acids if the salts constitute the dangerous factor.

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Pathogenesis of hard tissue destruction

Reidar F. Sognnaes. *Columni* 21:6-7 May 1958

A comparison between resorption of the several dental hard tissues with that of bone leads to the following conclusions:

1. All elements of the resorbable tissues, whether dental or skeletal, inorganic or organic, disintegrate simultaneously, as indicated most convincingly by microroentgenographic examination.

2. Resorbability does not appear to be dependent on the degree of calcification, the relative amount of amorphous ground substance or the quantity of the fibrous organic framework, be it collagenous or keratinous.

3. The origin of the multinucleated osteoclastic giant cells cannot be attributed to antecedent cellular elements peculiar to the hard tissue and therefore must be presumed to arise from extraneous mesenchymal cells brought in juxtaposition to the resorbing tissues.

The pathogenesis of the lesion of dental caries, unlike the pathogenesis of resorption in which the inorganic and organic elements appear to disintegrate simultaneously, is characterized by extensive demineralization and bacterial invasion along the dentinal tubules prior to disintegration of the fibrous organic elements of the matrix.

In contrast to dental caries, dental erosion exhibits a relatively smooth and clean-looking surface macroscopically. Nevertheless, histologic examination shows that such lesions are not necessarily devoid of superficial deposits of salivary and bacterial origin. Microroentgenographic examination indicates that in the acute stage an external zone of demineralization extends to a depth of up to 100 microns prior to disintegration of the organic framework. This lesion differs further from caries in that the destruction occurs by a frontal attack on the intertubular matrix and in the absence of penetration along the dentinal tubules.

Because teeth, unlike bone, are protected from complete cellular reconstruction once they are fully formed, developmental faults in calcification remain throughout life. Recent research with radioactive isotopes, however, suggests that within certain limits the teeth are subject to a chemical type of ionic exchange. In the external surface of the teeth there is an increment of trace elements with age. Conversely, if the equilibrium is altered the teeth are subject to withdrawal of chemical constituents long before this becomes evident macroscopically as a full-fledged lesion identifiable as dental erosion or caries.

The greatest promise for preventive dentistry exists at this early biochemical stage. It is hoped that, once more is learned about the nature of the chemical equilibrium between the solid phase of the teeth and their fluid environment, such incipient biochemical lesions may be reversed, either by inducing more ideal physiologic conditions or by the application of more intelligently conceived chemical agents to the tooth surface.

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Anatomy

Premature synostosis of the frontal suture in the cleft palate skull

Melvin L. Moss. *Plast.&Reconstr.Surg.* 20:199-205 Sept. 1957

Recent investigations by the author (1956) have established that a malformation of the skull base is characteristic of the cleft palate condition. This malformation was designated as "dysostosis sphenoidalis," and referred to a malrelation between the three components of the skull base, the basioccipital, the basisphenoid and the ethmoid, as well as to a malrelation between the several components of the sphenoid bone.

Examination of a series of patients with cleft lip or cleft palate, by digital palpation of the skull, revealed that of the many deviations from normal ectocranial contour noted, a ridge or crest of bone at the site of the frontal sutural region was the most frequent. An investigation was undertaken to determine if such premature synosteosis of the frontal (metopic) suture occurs with significantly greater frequency in patients with cleft palate than in patients with no cleft.

An examination of 80 white patients with cleft palate and of 354 white and negro patients without cleft palate showed that premature synosteosis of the frontal suture occurs three times more frequently in the skulls of those with cleft palate than in the skulls of those without cleft palate.

Such a synosteosis is evidenced by a pronounced ridging of the ectocranial surface over the site of the suture. In the skulls of those with cleft and without cleft palate, the incidence of such ridging is greater in males than in females. In those without cleft palate, such ridging is more frequent in negroes than in whites. Premature frontal synosteosis and ridging are associated with a malformation of the skull base, characterized by basal kyphosis and dysostosis sphenoidalis.

A hypothesis is presented which states that the basal malformation induces changes in the organization of the dura mater which, in turn, is causally related to the synosteosis. This hypothesis is examined in the light of the theories of the etiology of cleft palate. The existence of such a basal malformation in patients with cleft palate is correlated with the high incidence of frontal synosteosis in this group.

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Continuous cementum apposition

Helmut A. Zander. *Parodontol.,Zürich* 12:23-24 May 1958 [in English]

The cementum volume, the surface area of dentin and the outer circumference of the cementum layer were measured in 110 human teeth, collected at random at the University of Minnesota School of Dentistry.

These teeth were all single-rooted and came from two patient groups, the first ranging in age from 11 to 20 years, and the second from 52 to 76 years. The average age in Group 1 was 17 years, and in Group 2, 59 years.

The teeth were sectioned serially, horizontally, from the apex to the cementoenamel junction. Tracings at a 25 times magnification were made from all sections. The cementum volume, the surface area of dentin and the outer circumference of the cementum layer were measured from these tracings. On the basis of the measurements obtained, the thickness of cementum could be calculated. The average thickness of the cementum in teeth of Group 1 was 0.076 mm.; the average thickness of the cementum in teeth of Group 2 was 0.206 mm. The cementum thickness in teeth of the older group, therefore, appeared to be about three times that of teeth of the younger group.

Measurements of the cementum thickness were obtained from specimens of (1) the first apical 0.8 mm., (2) the mid-section, and (3) the cementoenamel junction. It was established that the cementum thickness for these regions in Group 1 was (1) 0.2 mm., (2) 0.072 mm., and (3) 0.055 mm. In Group 2, the thickness was (1) 0.536 mm., (2) 0.226 mm., and (3) 0.125 mm.

This study will be continued with a larger amount of tooth material from patients of different ages. Therefore, this must be considered as a preliminary report.

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The nerve supply of the soft palate

I. W. Broomhead. *Brit.J.Plast.Surg.* 10:81-88 July 1957

Investigation has been made of the nerve supply of the soft palate, in order to determine the effect of nerve section on the mucous glands of the soft palate.

Serial sections of the heads of three human embryos were stained and examined. The nerves to the soft palate could be followed from the origin of the nerve to its distribution in the muscle.

The nerve to the tensor palati muscle arises from the nerve to the medial pterygoid muscle, and passes forward and medially to the posteroinferior border of the muscle and enters as two branches. A branch from the pharyngeal branch of the vagus nerve ascends on the lateral aspect of the superior constrictor muscle to the sinus of Morgagni, where it divides into three branches before entering the levator palati muscle near the base of the skull.

The palatopharyngeal muscle is supplied by nerve fibers from the pharyngeal plexus, which enter the muscle after passing into the pharynx between the superior and middle constrictor muscles of the pharynx. The lesser palatine nerves enter the palate on the oral aspect of the palatine aponeurosis, and pass through the aponeurosis to lie beneath the nasal epithelium of the palate. As the nerves pass toward the uvula, small twigs are given off to enter and supply the uvulae muscle. These are the only nerve fibers supplying the muscle.

Examination of 50 skulls in the Museum of the Royal College of Surgeons confirmed that the lesser palatine nerves are divided in the freeing of the soft palate from the posterior edge of the bony palate.

In experiments in rats, division of the descending palatine nerve did not lead to any degenerative changes in the mucous glands of the soft palate. The conclusion to be made is that the mucous glands of the palate are independent of control from the descending palatine nerves. When this conclusion is applied to human patients, it seems unlikely that division of the lesser palatine nerves will lead to loss of substance in the soft palate from degeneration of the mucous glands.

There has been no opportunity for the histologic examination of a human soft palate subjected to a cleft palate repair. From the clinical examination of patients with repaired cleft palates, the repaired soft palate appears to be externally normal, and in lateral roentgenograms the thickness of the structure appears normal.

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History

The Crawcours

J. Menzies Campbell. *D.Practitioner* 8:108-109 Dec. 1957

Today amalgam is universally accepted as an invaluable agent in conservative dentistry, thanks to the investigations of G. V. Black. Nevertheless its earlier history was checkered.

In the late 1820's and early 1830's, several French dentists were practicing in Great Britain and advertising "Mineral Succedaneum" as the latest and best medium for filling teeth. The Crawcours stated that they were "the sole and original proprietors" of this preparation; other evidence seems to confirm the accuracy of their claim.

There were many Crawcours, all notorious empirics of French derivation, who designated themselves surgeon-dentists. Research concerning individual members of this family has proved difficult, mainly because it was customary for most of them to advertise merely as "Mr." or "Messrs." Crawcour. A descendant of the Crawcours told the author that one family consisted of five brothers (all dentists), whose sons, too, followed the same occupation. The policy of all the Crawcours was to advertise extensively, proclaiming in a reckless manner unusual skill and ability to preserve the natural teeth. For this purpose they exploited their "Mineral Succedaneum." They claimed that it was the equal of gold as a filling, besides costing considerably less. It was, in fact, an amalgam comprising mercury and coarse filings from French silver coins. With this, they professed to be able to fill teeth "in about two minutes, without the slightest pain, inconvenience or pressure." They were not interested in the excavation of caries, except the barest minimum removed only when essential for a filling to be inserted.

The Crawcours systematically visited innumerable cities and towns in Great Britain, besides continuing to practice in Paris. As was to be expected from the Crawcours' technic, instances of pulpitis or alveolar abscesses occurred frequently. The burden of extracting such painful teeth devolved on more reputable dentists and surgeons.

The professions and glamour of the Crawcours being hypnotic, they ensnared innumerable gullible victims. In 1833 they applied the prefix "Royal" to the name of their filling material, simultaneously claiming to be surgeon-dentists to the Royal Family, and patronized by the courts of Austria, France, Russia, Prussia and Belgium.

Two of the brothers, having been outstandingly successful financially in Great Britain, visited the United States. In 1833 they introduced "Royal Mineral Succedaneum" into New York, with tactics similar to those pursued in Great Britain. For a time, fillings of this material, because of their easy and quick insertion, superseded the painful and tedious gold foil pluggings. It was the beginning of the end for these unscrupulous quacks when medical and dental practitioners in America were able to convince the laity that mercurial salivation frequently resulted from the clumsy application of the Crawcours' fillings. These were inserted, without any regard to the anatomy of the teeth, in excessive quantities on the occlusal surfaces. When the jaws were occluded, the excessive mercury was expelled and swallowed. Nation-wide indignation forced the Crawcours in 1834 to flee from America. Nevertheless, the returned exiles and their dentist relatives continued to practice in Great Britain and to advertise extensively. No further mention was made of "Royal Mineral Succedaneum." Instead, the Crawcours asserted they had discovered a new filling material, "Royal Asiatic Puzzolano"; actually, it was the identical product.

Despite the fact that many Crawcours had practiced dentistry throughout Great Britain for almost a century, only one—John Crawcour—was entitled to register under the Dentists Act, 1878. None registered under the 1921 Act.

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Therapeutics

Treatment of malignant oral tumors with "Endoxan," a new nitrogen mustard derivative: preliminary report

R. Gross and K. Lambers. *Deut.med.Wschr.* 83:458-462 March 21, 1958

A nitrogen mustard phosphamide ester, "Endoxan," was used in the postoperative treatment of 45 patients with various types of malignant oral tumors, at the Cancer Clinic of the University of Marburg/Lahn, Germany.

This is a preliminary report on the drug's effectiveness in preventing neoplastic growth and metastases after surgery.

Daily doses of 150 mg. were generally tolerated, and higher doses (up to 250 mg.) occasionally endured without injurious effect. The total dose administered during the course of one treatment was 5 Gm., but in isolated instances as much as 10 Gm. was given.

Of the 45 patients postoperatively treated with Endoxan, five developed a mild decrease in the number of granulocytes in the blood. Not in a single instance, however, did there occur granulopenia or a significant decrease in the number of erythrocytes and thrombocytes. There was no demonstrable disturbance in the function of the liver or kidneys.

In 58 per cent of the patients treated with Endoxan, recurrence of the tumor or metastasis were not observed during a significant follow-up and control period. In 33 per cent Endoxan treatment combined with roentgenotherapy obtained complete remission of recurrent tumors. Only 11 per cent of the patients did not respond to the (probably too low) doses administered.

Because of the absence of significant side effects in the majority of patients treated, Endoxan can be considered to be of value in the prevention of recurrence or metastasis of tumors after radical surgical removal, perhaps in combination or alternation with roentgenotherapy.

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Clinical experience with two new cytostatic agents in the treatment of malignant oral tumors

N. J. Perevodchikova. *Deut.med.Wschr.* 83:21-23 Jan. 3, 1958

Two newly introduced cytostatic drugs, "Sarkolysin" and "Dopan," were investigated at the Institute for Experimental Pathology and Therapy of Cancer, Moscow, U.S.S.R., to evaluate their clinical effect in the treatment of malignant oral tumors.

"Sarkolysin," DL-4-[bis-(2'chloroethyl)-amino]-phenylalanine hydrochloride, developed by Chochlow, Shkodinskaja and Wassina, was used in 143 patients with inoperable metastasizing neoplasms in which either the primary tumor or its metastases were located in the oral cavity. Favorable results were obtained in instances of reticulum cell sarcoma, endothelial myeloma (Ewing's tumor), endothelioma and in metastases of seminoma and thymometastases. The cytostatic drug was administered once a week, to a total dose of from 200 to 250 mg. In isolated instances, leukopenia and thrombocytopenia occurred as side effects.

"Dopan," 4-methyl-5-[bis-(2'chloroethyl)-amino]-uracil, synthesized by Platonowa, shows a cytostatic spectrum similar to that of chloroethylamine. This cytostatic agent was used in 61 patients with oral manifestations of Hodgkin's disease or chronic leukemia. Daily oral doses of 10 mg. were given, with intervals of from four to five days, to a total dose not exceeding 80 mg. No gastrointestinal disturbances occurred. Leukopenia and thrombocytopenia appeared in isolated instances as side effects but in so mild a form that "Dopan" can be recommended as the drug of choice in the treatment of malignant oral tumors and Hodgkin's disease.

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Histology

Differential staining of connective tissue fibers in areas of stress

Harold M. Fullmer. *Science* 127:1240 May 23, 1958

During the course of investigations of age changes in connective tissues, sections of human jaws and teeth fixed in Formalin were oxidized in peracetic acid for 30 minutes and subsequently stained with aldehyde fuchsin. Many fibers of the periodontal membrane stained a brilliant purple; others remained unstained. The fibers that remained unstained were birefringent and therefore are believed to be collagen. The purple-stained fibers were interspersed between collagen fibers and were not birefringent. They were round, elliptical, or flattened on cross section, and varied in diameter from 3 to less than 0.5 microns; the larger ones were more than 2 mm. long.

In the mid and apical portions of the roots of teeth, these fibers were anchored either in the cementum or bone on one end; they frequently ramified as they followed the course of the principal fibers. It was not possible to trace a single fiber that extended from the tooth to the bone. In the region of the cementoenamel junction, the fibers were anchored in the cementum and either curved upward into the gingiva, along with the collagen fibers, or joined with the transseptal group. In addition, at all levels of the periodontal and gingival tissues in mesiodistal sections, numerous fibers were seen, cut crosswise or tangentially; this indicated their multidirectional course.

These fibers also were found in tendons, ligaments, the adventitia of blood vessels, in the connective tissue sheath surrounding hair follicles, and in the epineurium and perineurium of the human being. The fibers were found in the periodontal membranes of human beings, mice, rats and guinea pigs, and in the Achilles tendons or patellar ligaments, or both, of human beings, monkeys, mice, rats, guinea pig and a turkey.

Undoubtedly, these fibers have been called collagen heretofore, and further investigation may reveal them to be a form of collagen that develops in regions of stress. Since they are not found in skin or in granulation tissue, it is unlikely that they are a form of procollagen or aged collagen.

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On the use of modified fifteen-minute hematoxylin and eosin tissue stain

Helenmae Clark and Robert J. Gorlin. *Oral Surg., Oral Med. & Oral Path.* 11:431-432 April 1958

A rapid, simple, uniformly successful staining method that is a modification of a method introduced by Ziegler (1944) has produced outstanding results. A wide variety of tissues can be stained successfully. There is good contrast between the bluish purple shades and the pink counterstain. Best results were obtained when a 10 per cent Formalin solution was used as a fixative.

After the sections are cut and fixed on slides, they are either deparaffinized in an oven at 60° for 15 minutes or placed in xylene for four minutes. The slides then are dipped in the following solutions:

1. Xylene, eight times, and second xylene, eight times
2. Absolute alcohol, eight times
3. Second absolute alcohol, eight times
4. Ninety-five per cent alcohol, eight times
5. Isotonic saline, eight times
6. Ripened Delafield or Harris alum hematoxylin, filtered, six minutes
7. Isotonic saline, eight times
8. Two per cent solution of phosphotungstic acid in isotonic saline, four times
9. Isotonic saline, eight times
10. Two per cent solution of sodium citrate in isotonic saline, four times
11. Isotonic saline, eight times
12. Seventy per cent alcohol, eight times
13. Five per cent solution of eosin in a 50:50

solution of absolute alcohol-distilled water, two minutes

14. Ninety-five per cent alcohol, eight times
15. Absolute alcohol, eight times
16. Second absolute alcohol, eight times
17. Xylene, eight times
18. Second xylene, eight times
19. Mount in balsam, eight times.

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Effect of complete dentures on the gum tissues: a histological and histopathological investigation

Stig G:son Östlund. *Acta odont.scandinav.* 16:1-41 May 1958 [in English]

When the teeth are lost and the patient fitted with complete dentures, large areas of the oral mucosa are covered with more or less unyielding baseplates which compress and wear the mucosa on occlusion and articulation. A high frequency of gross changes in gingival tissue is found in persons wearing complete dentures.

A study was undertaken to investigate the normal histologic picture of the palatine mucosa and to analyze the changes occurring as a result of the wearing of a complete denture. About 50 patients were examined, from 6 to 36 months after they had been treated at the department of prosthetics of the Royal Dental School in Malmö. In order to obtain biopsy specimens as comparable as possible, the specimens were removed from a limited region, namely the ventral angle between the medial sagittal plane and a plane through the line marking the border between the movable and nonmovable soft and hard part of the palate.

The measurements, observations and their statistical analysis suggested the following conclusions:

1. In the region studied the palatine mucosa is about 3 mm. thick. It is slightly but significantly thicker in men than in women.

2. The epithelium, which was on the average 0.18 mm. thick in patients without complete upper dentures, increased to a thickness of 0.28 mm. in association with inflammation.

3. The epithelium normally is covered by a horny layer which protects the underlying tissues against mechanical, chemical and bacterial injury.

4. Within the first six months after complete dentures were fitted, the epithelium of most patients showed a pronounced change despite the clinically normal appearance of the mucosa. The changes progress in a typical way. The stratum corneum decreases in thickness with a simultaneous thinning of the stratum granulosum. Only in one patient did the stratum corneum increase in thickness to such an extent as to be regarded as hyperkeratosis. A defined stratum corneum disappears as does the stratum granulosum. The cell nuclei become visible to the surface of the epithelium, but an outer zone of epithelium still stains with eosin, to indicate parakeratosis. All keratin disappear from the epithelial layer and the cells of the stratum spinosum change in appearance. First, the cell cytoplasm swells in the outer zone so that the intercellular spaces disappear. Then the cells are pressed together by the accumulation of fluid in the intercellular spaces, whereby the tonofibrils are distended and separated from one another. At the same time, an increase occurs in the cell nuclei and cytoplasm in the central part of the stratum spinosum. During the initial stages of the tissue changes, the number of mitoses increases, probably to compensate for the increased strain placed on the surface epithelium by the wearing of the denture; if the injury is more advanced, the number of mitoses decreases. At an early stage the connective tissue becomes edematous; this appears mainly as an extension of the fibrillar structures connecting the base membrane to the lamina propria. Gradually, the connective tissue papillae are pressed up toward the surface of the epithelium, which then shows protuberances here and there. The increase observed in the epithelium thus is due partly to an increase in the volume of the individual cells and partly to edematization of the tissues.

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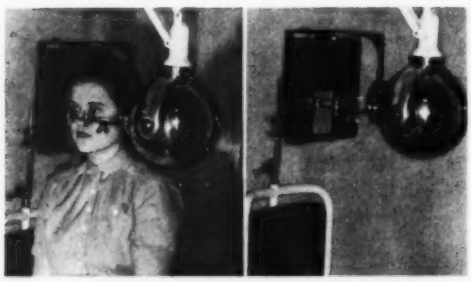
Orthodontics

Roentgenographic representation of the temporomandibular joint: its importance in orthodontics

Hans Müller. *Zahnärztl.Welt & Reform* 11/57:201-206 July 25, 1957

The relation between occlusion (malocclusion) and the form and position of the temporomandibular joint was studied in patients with normal and abnormal dentitions in the orthodontic and prosthetic departments of the Dental School of the University of Leipzig, Germany.

The masticatory apparatus must be regarded as a functional anatomic unit in which a harmonious balance should exist or be obtained (Steinhardt). The inclination of the articular plane depends on the amount of overbite present.



Focusing (Parma's contrast exposure method)

In Angle's Class II malocclusion, its divisions and subdivisions, the articular tubercle usually is positioned at a higher level than in Class III malocclusion, its divisions and subdivisions (Hausser). In these instances, the normally existing harmony between form and function is severely disturbed, especially if the balance between the occlusion and the temporomandibular joint is not maintained or is unfavorably influenced by hereditary factors.

The proper evaluation of form, position and condition of the temporomandibular joint, extremely important in orthodontic treatment, can be obtained only by special roentgenographic (teleroentgenographic) technics and by proper interpretation of serial roentgenograms.

The location of the temporomandibular joint near the base of the skull impedes the taking of interpretable pictures. The equal exposure to central roentgen rays, necessary for comparison, frequently meets with difficulties.

An excellent representation of the temporomandibular joint can be obtained if Parma's contact exposure method is used. The central roentgen rays are directed toward both condyles. A specially constructed focusing device permits the reproduction of almost identical roentgenograms which are necessary for checking and comparing.

Focusing (Zimmer's periorbital method)

Focusing (Schüller-Lindblom's pericranial method)

For orthodontic correction of most types of malocclusion it is important to determine whether the joint is in an open or closed position. In "locked bite" the closed position predominates, whereas in "shear bite" the open position prevails.

In treatment of these conditions, orthodontic appliances specially designed to obtain a transversal movement of the teeth should be used.

For roentgenograms of the temporomandibular joint in sagittal projection, Zimmer's periorbital method is recommended because it permits the taking of pictures of patients in a sitting and restful position. The central roentgen rays are directed toward the joint through the medial angle of the eye. The required distance between the cone and the orbit is 5 cm. The patient should open his mouth as wide as possible, and turn his head toward the x-ray machine. After the first roentgenogram is taken, the patient should move his head forward (second exposure) and downward until his chin touches his throat (third exposure). In all roentgenograms, the form of the condyles will appear relatively undistorted. The films can be developed in the customary manner. Preference, however, is given to the time-temperature development method, that is five minutes at 67°F.

Schüller-Lindblom's pericranial method embraces all the essential factors in registering a clear, easily interpretable representation of the temporomandibular joint without distortion or confusing superimposition.

The difference between roentgenograms taken in the prone and upright positions is hardly discernible. The displacement of the condyle is minimized if the patient's head is placed on the especially constructed headrest.

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Preliminary macroscopic observations concerning the potentiality of supra-alveolar collagenous fibers in orthodontics

H. E. Thompson, Hugh I. Myers,
J. M. Waterman and Viola D. Flanagan.
Am.J.Orthodont. 44:485-497 July 1958

The development and maintenance of the proper alignment of the dentition may involve three groups of factors: (1) the reactions of the bone and periodontal membrane to pressures and tensions; (2) muscle balance, and (3) the connective tissue superior to the alveolar bone, that is, the transseptal and gingival fibers. A study was undertaken to determine what influence, if any, these supra-alveolar fibers have on tooth movement and retention.

In the Cynomolgus monkey, a central or lateral permanent incisor was extracted from the maxillary and mandibular arches in opposite quadrants. Bands with edgewise brackets were placed on the teeth adjoining the extraction area. Within four to six months the adjacent teeth were moved into the extraction space. As soon as the teeth were in contact, a complete gingivectomy was performed around the approximated teeth. After a three week period for the gingivectomy to heal, the ligature wire was removed. In control animals, the approximated teeth were held in contact about three weeks, no gingivectomy was performed, and the teeth were then released from any orthodontic force. Both the control and experimental animals were observed periodically for from 6 to 18 weeks, sacrificed, and the jaws preserved for future histologic study.

The percentage of drift or relapse after orthodontic tooth movement during the observation period was 10 per cent in the experimental animals, 44 per cent in the control animals.

It is a basic concept of the authors that bone is destroyed and produced rather easily, but that the collagenous connective tissue fibers are relatively inert and that these fibers tend to maintain the original position of the tooth when the fibers were formed and to resist any change. If uncontrolled, these fibers would tend to return to their original conformation and carry with them the teeth which they surround and to which they are attached, thus causing relapse. A gingivectomy might release this tension, and then new fibers would form without tension, thus mitigating the tendency to relapse. Macroscopic observation in this study tends to support this concept but also indicates that some complicating factors may alter the result. The histologic findings on these animals, and observations on additional animals, will be reported later.

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General

Tattooing in the service of surgery

Norman C. Lake. *Brit.M.J. No.* 5079:1084-1087 May 10, 1958

The main object of surgical tattooing is cosmetic, and tattooing can be employed as an adjunct to a substitute for plastic surgery. Small areas can be tattooed in relatively insensitive parts without any anesthetic; in surgical work for large, sensitive areas, however, either a local or a general anesthetic is necessary.

Although the hand method of tattooing can be employed by the surgeon if the area to be covered is small, usually a vibratory machine is used. The needle points, six to ten in number, are usually protected by an adjustable guard which enables the depth of penetration to be varied according to the thickness of the dermis and epidermis. The average penetration is 2 to 3 mm. The needles must be sterilizable. The powdered pigment is mixed with a little water to form a paste in a container which can be placed in the ordinary instrument sterilizer.

The area to be tattooed is prepared and covered with the paste through which the needles work. During the tattooing, the skin should be kept stretched and steady. The area to be covered must be marked out; as such markings may be obscured when the paste is applied, it is sometimes of value to use a template. This is particularly so when a definite line has to be followed —for example, the red lip margin.

One of the surgical uses of tattooing is to restore the red lip margin after an operation for cleft lip. Figure 1 shows an easily made sheet metal template, for use in tattooing the "cupid's bow" on the lip. A second backing template (with a notch for the frenum if this is present) fits into the labial recess to provide even counterpressure during tattooing.

Figure 2 is a print from a color photograph of a patient after the red lip margin had been restored through tattooing. Before tattooing, practically no red margin was visible. The pigment used was a mixture of "red oxide R.93A" and "irgalite orange P."

Surgical tattooing also can be used to provide simulated eyebrows, beard stubble, fingernails, toenails, nipples and umbilici.

Charing Cross Hospital, London, England

Figure 1 Sheet metal template for use while tattooing "cupid's bow" on lip. Notch in upper margin is to clear the columella if lip is shallow

Figure 2 Red margin of upper lip, restored by surgical tattooing. Before tattooing, cleft lip had practically no red margin

Dental considerations of patients receiving medical care

Council on Dental Therapeutics
of the American Dental Association
Accepted Dental Remedies 23:1-6, 1958

A patient who seeks dental service while receiving medication or treatment by a physician may present special problems for the dentist. In such a patient, either the disease being treated or the effect of the general medication may influence the dentist in his selection of drugs and procedures. Providing comprehensive health service in many instances will require cooperation between the dentist and the physician.

Patients with diseases of the cardiovascular system require special consideration. The patient's physician should be consulted prior to extensive operative procedures or administration of a general anesthetic. Premedication with a sedative is desirable, and a reassuring and considerate attitude is important. Apprehension, worry and long, fatiguing dental procedures should be minimized. These factors stimulate the discharge of epinephrine into the circulation, and the resulting generalized vasoconstrictive activity may give rise to an elevation in blood pressure and other effects which can place an unusual strain on the cardiovascular system. Epinephrine, introduced with a local anesthetic solution, normally is injected extravascularly, in a quantity that is too small to produce a significant deleterious effect.

Nitroglycerin and amyl nitrite frequently are prescribed by the physician to relieve distress in attacks of angina pectoris. These drugs are administered to dilate the coronary vessels, but their action is not selective and many other vessels are affected. An abrupt fall in blood pressure may ensue, which can result in fainting. Pain, apprehension and excitement may provoke anginal attacks in patients for whom these drugs are prescribed. Numerous antihypertensive drugs are being used extensively in medicine and may produce nausea and vomiting. Hypertensive patients under treatment with these drugs may develop postural hypotension or fainting; sudden changes in posture may cause loss of consciousness.

Patients with a history of coronary thrombosis may receive anticoagulants. The use of such drugs will predispose toward hemorrhage after any oral surgery. Spontaneous hemorrhage from the gingiva may be associated with the administration of anticoagulants. Interruption of anticoagulant treatment should be authorized by the physician in charge of the patient. If treatment cannot be interrupted, the dentist must anticipate the bleeding problem, and take steps to control hemorrhage by local procedures such as pressure, augmented with the topical application of thrombin or other hemostatic agents.

A variety of drugs may be employed for patients who are in the various stages of myocardial insufficiency. Many patients maintained on this type of medication over prolonged periods of time develop a tendency toward nausea and vomiting. Particular care is indicated to avoid stimulation of the vomiting reflex and to prevent aspiration of regurgitated matter.

Patients with rheumatic or congenital heart disease require special care. In these individuals the potential critical danger is related to the development of bacterial endocarditis from bacteremias associated with dental procedures. Preventive antibiotic therapy is mandatory whenever soft tissue trauma occurs, as in extraction, periodontal treatment, endodontal surgery and other surgical procedures.

In diabetic patients, prior to elective oral surgical interventions, assurance should be received from the patient's physician relative to the control of diabetes. In the event emergency dental procedures must be performed, every effort should be made to obtain medical assistance. Whenever possible, diabetic patients should be hospitalized for oral surgery and postoperative care.

Patients with hypothyroidism may be taking thyroid or thyroxin. These patients, as well as those with goiter, have a low tolerance for opium derivatives. It is recommended that barbiturates rather than opiates be prescribed for sedation or hypnosis, and that nonopiate analgesics be employed for the control of pain.

Patients with a history of general allergy are more likely to manifest hypersensitive reactions to local anesthetics, antibiotics and other therapeutic agents used in dentistry. Such patients may be receiving more or less continuous treat-

ment with ephedrine or xanthine derivatives, principally aminophylline. When sedation is indicated for dental procedures, doses larger than usual may be required.

In patients with liver diseases, whether or not they manifest jaundice as a symptom, blood clotting may be delayed. In patients displaying jaundice, consultation with the physician is essential prior to any dental surgical procedure. If the prothrombin time is abnormal, the defect may be corrected by vitamin K therapy, prophylactically administered for at least two days prior to oral surgery, preferably by the parenteral use of menadione sodium bisulfite.

222 East Superior Street, Chicago 11, Ill.

Notes on dentistry in Holland

Governors Letter, Canad.D.A. 8:1-7
April 10, 1958

Today in The Netherlands, about 80 per cent of the 11,000,000 people participate in the health insurance system, in the form of Sick Funds. The Sick Funds began many years ago as voluntary insurance associations but in 1941 were transformed by legislation into compulsory organizations for all under a certain income. Membership in a Sick Fund entitles the member and his family to medical treatment, pharmaceutical supplies, hospital and dental care.

Dental services for children up to age 21 are free. After age 21 the patient pays a fee in accordance with a fixed schedule. For instance, if a filling costs 4.5 guilders [$1.17], the patient pays 1.5 guilders and the balance is paid from the fund. The program does not include orthodontic treatment.

The health insurance system places a premium on being dentally fit. If a patient keeps regular appointments every six months, fillings are free but the patient must pay for dentures. If the patient neglects to visit a dentist every six months, he must become dentally fit at his own expense before being taken back into the program. About 25 per cent of the population are said to be dentally fit. About 17 per cent of the people wear dentures. A recent regulation stipulates that no person after 40 years of age can be classified as dentally fit.

The health insurance program is financed by membership fees paid to the Sick Funds; the funds are subsidized heavily by the government. Dentists are paid by the Sick Funds on a fixed fee schedule negotiated between representatives of the funds and representatives of the dental profession. The fee schedule is so low that dentists are forced to work long hours in order to make a living. The average gross income of dentists is probably $10,400 to $13,000 a year; taxation is high.

Since 1946 the Netherlands Dental Association has been negotiating almost continuously with the Sick Funds.

The ratio of dentist to population is 1:4,800. Of the 2,500 dentists, 1,500 work under the health insurance program, from 300 to 400 work in the school dental service and the balance are in private practice. There is a lack of applicants for dental school, and the Association is planning to institute a recruitment drive. There are no dental assistants or dental hygienists in the country. A training program for dental technicians by apprenticeship is established, with examinations. To become a laboratory owner, the technician must meet additional requirements of a higher standard.

There are two dental schools. The Dental Institute of the University of Utrecht was established in 1887, has clinical facilities for 60 students and in the first year accepts 100 students. The Dental School of the University of Groningen was established in 1947, has clinical facilities for 30 students and accepts 45 in the first year. Both schools are departments of the Faculty of Medicine of each university. The dental course is six years, the first two years being known as selective years. The dental student pays an annual academic fee of $52. The student purchases his own instruments at a total cost of about $1,560, with the government rebating half the cost. The university title of Tandarts is granted at graduation. This title is restricted by law to persons authorized to practice dentistry. The degree of Dr.Med.Dent. may be awarded on presentation of a thesis.

For the most part, dental services are rendered in private offices, but in some of the larger towns, polyclinics exist.

234 St. George Street, Toronto 5, Canada

The presence of bacteria in the healthy gingival sulcus

William S. Boyd and S. Leonard Rosenthal. *J.D.Res.* 37:288-291 April 1958

Waerhaug and Steen (1952) concluded that the normal gingival sulcus is sterile, being subject to bacterial invasion only after subgingival calculus formation. A study was undertaken to attempt to confirm their observations.

Eighty-six examinations were made of 78 sulci in 33 patients. Of the sulci examined, 75 were labial and 11 were lingual.

The healthy gingival sulcus in not sterile. Bacteria were present in 95.9 per cent of orally healthy adults, 90 per cent of adults at the successful conclusion of periodontal treatment, and 88.8 per cent of children.

Identified organisms in the order of frequency of occurrence were: *Neisseria catarrhalis, Streptococcus alpha hemolyticus,* yeasts, pneumococci, *Staphylococcus albus hemolyticus, Diplococcus pneumoniae,* lactobacilli, *Str. pyogenes, Sarcina lutea,* and *Str. beta hemolyticus.*

Sterilization of the teeth and gingivae with a solution consisting of zinc iodide 15 parts, iodine crystals 8 parts, glycerin 50 parts, and water 10 parts, sterilizes the sulcus.

School of Dentistry, Temple University, Philadelphia, Pa.

Testing for fluoride idiosyncrasy

J.A.M.A. 166:1405 March 15, 1958

Q.—What tests and office procedures can be used to determine individual idiosyncrasy or intolerance to fluorides? Are there practical tests available to the family doctor which he can use to determine whether various subjective complaints are actually caused by fluoride ingestion or [are] just a fear reaction to artificially fluoridated water in a community?

A.—What is here asked does not exist. There are no simple tests for blood or urinary fluorides, such as may be carried out by the physician in his office or by the usual clinical laboratory. Precise tests require a high degree of chemical skill and equipment of uncommon nature. In hundreds of instances, these tests have been applied in children and adults prior to the institution of artificial fluoridation, as well as during long periods of imbibition of properly fluoridated water, after removal from an area with a fluoridated water supply, and after defluoridation of waters naturally high in fluorides. In adults, on initial exposure to fluoridated water, the urinary fluoride increases in time and in proportion to the fluoride intake, but a balance is reached after which the output essentially equals the intake. In growing children, the leveling-off point is not reached during the growth period, but fluoride retention remains within the limits of tolerance. There is no evidence that the quantity of fluorides thus entering the body leads to any demonstrable indications of harm. This statement does not apply to water consumption when the natural fluoride content is excessive nor to high industrial intake of fluorides. There are no confirmed reports of chronic fluoride poisoning from properly artificially fluoridated waters.

535 North Dearborn Street, Chicago 10, Ill.

Dentist, dental laboratory, and the patient

A. H. Grunewald. *J.Pros.Den.* 8:55-60 Jan. 1958

Many dentists fear that the dental laboratories are aiming to usurp professional functions. If such a trend exists, it cannot be stopped by law alone; it can be eliminated only by the dentist's knowing and meeting his responsibilities.

The dentist must know the basic principles underlying prosthodontic procedures, and must be able to perform those procedures. In the construction of complete dentures, the dentist should carry out the following procedures as a minimum:

1. Complete the oral examination and diagnosis.
2. Make the impressions.
3. Contour the wax occlusion rims.
4. Establish the vertical dimension.
5. Obtain a face-bow registration.
6. Establish unstrained maxillomandibular relations.
7. Determine the plan of treatment.
8. Select the teeth.
9. Alter the trial setup as indicated.
10. Provide the postpalatal seal and outline the palatal relief.

11. Remount the dentures and equilibrate the occlusion.

12. Insert and adjust the dentures.

13. Provide the proper follow-up service.

The dentist must have a thorough basic knowledge of prosthodontics and a sufficient degree of skill and digital dexterity. This combination provides the foundation and confidence necessary to direct and utilize the services of prosthetic technicians properly.

Some recent dental graduates lack the confidence to meet their responsibilities. This lack of confidence stems from a lack of sufficient training and experience in the undergraduate dental school. Perhaps better use could be made of the time allotted in dental schools to the principles and practice of prosthodontics.

Good relations between the dentist and the dental laboratory usually can be established and maintained if the dentist employs one of the better laboratories. A good dental laboratory: (1) shows the proper consideration for design, materials and technic; (2) has personnel interested in self-improvement and willing to attend appropriate meetings and courses; (3) does not stress price as a means of getting business; (4) does not attempt to cover up errors; (5) uses materials which meet the specifications of the American Dental Association whenever possible; (6) has employees capable of employing an adjustable articulator; (7) voluntarily returns work to the dentist for inspection and approval, when in doubt, before proceeding with the next step; (8) normally returns partial dentures on the master cast, with evidence of consideration for the survey and design, and (9) does not assume the right to include unsolicited procedures in the service it has been asked to provide.

The dentist should not expect miracles from the dental technician. The dentist should remember that the finished product can be no better than the foundation supplied. He should confer with the laboratory regarding a partial denture design, when indicated; should allow adequate time; should expect to make final adjustments in the mouth; should not demand that the laboratory accept responsibility for the success of a denture; should visit the laboratory occasionally to check the construction of the prosthesis, especially when difficult procedures requiring detailed instructions are involved. The dentist should offer constructive criticism; he should assume the role of a teacher, and make sure that technicians are provided an opportunity for self-improvement by means of clinics, and so forth, and should discuss with the laboratory personnel any new technic to be employed, and acquaint them with the procedures.

An additional means of eliminating misunderstanding and improving dental laboratory relations is through proper direction, prescription, or order.

There are more than 6,000 dental laboratories in the United States. All but a few are interested in serving the dental profession in a competent, ethical manner. Unfortunately, a small number of unethical laboratories are callous in their attitude toward the public welfare and indifferent to the requirements for rendering a good prosthetic service. They practice dentistry illegally. Dentists can protect themselves best against the illegal laboratories by contributing their share to public enlightenment and by fulfilling their own professional responsibilities to the highest possible degree at all times.

Dental School, Northwestern University, Chicago, Ill.

The development of the center of the face with particular reference to surgical correction of bilateral cleft lip

Richard B. Stark and Norbert A. Ehrmann.
Plast.& Reconstr.Surg. 21:177-192 March 1958

The literature of the embryology of the face is reviewed, and the conclusions compared with the findings in an examination of six human embryos with cleft lip and cleft palate and of three normal human embryos.

The classic view on the pathogenesis of cleft lip held it to be caused by a failure of fusion between facial processes. Cleft lip was considered a pure instance of "developmental arrest." Recent work, however, has indicated that the classic view is no longer tenable, since it is evident that no fusion of processes occurs in the region of the upper lip. From a study of six human embryos with cleft lip and cleft palate, it was concluded that the primitive palate (prolabium, premaxilla

and primary septum) is derived from an epithelial wall in which reside normally three mesodermal masses. This epithelial wall is present over the oral cavity and will develop normally if the mesoderm grows and coalesces between the three anlages. Failure of the dynamic process of mesodermal growth and coalescence is responsible for the appearance of either cleft lip or alveolar cleft. If mesoderm is absent unilaterally from the lip, a unilateral cleft results; if absent bilaterally, a bilateral cleft results. Mesoderm must be present in the midline of the growing lip if the primitive palate is to develop at all. The failure of mesodermal penetration represents a developmental arrest only in the sense that secondary mesenchyme fails to grow into a pre-existing epithelial wall, and the faulty primitive palate that results will assume any of several anomalous forms (unilateral, bilateral or median cleft lip).

The critical time for cleft of the palate to develop is distinct from that of cleft lip, since the two conditions do not coexist invariably. The normal process whereby the palatal shelves meet and unite during the seventh week of development occurs after mesodermal penetration of the epithelial wall that is to be the prolabium and premaxilla. In a word, cleft palate is an anomaly that occurs chronologically at a later time than cleft lip.

The organ of Jacobson and the prolabium are distinct anatomic entities. It is incorrect to regard them as synonymous.

The prolabium is a lip structure. It should be used in its entirety as the central lip element in repair of bilateral cleft lip. If the prolabium alone is used in repair of the central lip, a normal philtrum will develop. If the prolabium is placed onto the nose as columella, the columella will be hirsute in the male, and the lip will be greatly elongated and will develop bereft of its philtrum.

A cleft of the alveolus is a lip anomaly only, as a complete cleft of the lip signifies a cleft of the alveolus. A complete cleft of the palate, on the other hand, does not include a cleft of the alveolus. A palate is completely cleft if it is split as far anteriorly as the incisive foramen. In the light of the embryology of the central face, the proposal of a new classification of anomalies of the lip and palate appears justified.

20 East 68 Street, New York 21, N.Y.

Industrial dentistry from the standpoint of the general practitioner

D. W. Brock. *J.Missouri D.A.* 38:8-14 May 1958

In 1951 the Council on Dental Health of the American Dental Association conducted a survey to determine the extent and types of dental programs in industry. The answers evidenced a lack of uniformity of pattern for dental services. The Council found there was no general understanding as to the value and scope of dental programs in industry. In 1952 the Association's House of Delegates adopted resolutions on the subject, which said in part: "The industrial patient (employee) should have the right to select the private practitioner of his choice," and "The program should be developed in full consultation with the dental profession through the medium of state and local advisory committees." The suggested scope of the industrial program included the following: preplacement and periodic examination of all employees; emergency service, including treatment of injuries and diseases of an occupational nature; keeping of accurate dental records; education in dental health, and referral of employees to private practitioners.

The suggestions of the Association were not accorded full approval by industry. Management needs the advice and guidance of some reliable, experienced and authoritative source. This source logically should be the American Association of Industrial Dentists. This organization has not received the moral support of the dental profession on the local and state levels, nor has it received adequate support from official state and local industrial health agencies. The significance of dental health in industry has been relegated to a second-rate position. Likewise, concentration on the prevention and correction of dental diseases in children has diverted attention of the dental profession from the problems of adults. The situation has been further complicated by the development of labor health and welfare programs directed toward comprehensive health care of the employee. The industrial dental health program has been too remote from the private dentist to be appreciated.

Industrial dental programs are of great value in community health programs, provided the

former follow the policies adopted by the American Dental Association. Industrial dentistry is a "specialty of dentistry which is concerned with the dental health of the industrial worker as it affects or is affected by his general health and his working environment," and should be represented by a dentist qualified by previous training and experience. Industrial dentistry never has been properly sold to the dental profession, nor has it been properly and effectively sold to management. It has missed a golden opportunity to become an important facet in the community health program. The responsibility for the success of the industrial health program involves the dental profession, the industrial dentist, the official industrial health agency and management. A sincere effort on the part of all concerned will benefit a substantial number of the 60,000,000 persons in the national labor force.

6026 Enright Avenue, St. Louis, Mo.

Solder joints on plated rustless alloys

Saul M. Bien and Herbert D. Ayers, Jr. *J.D.Res.* 37:368-372 April 1958

When metals or alloys cannot ordinarily be soldered, it is the practice to make an electrochemical deposition of such materials as copper, nickel, silver or gold on the solder-resistant surface.

Three types of rustless alloys were plated, as follows:

1. 18-8 austenitic steel wire was anodically cleaned in a solution composed of 10 per cent sulfuric acid and 1 per cent hydrofluoric acid at 5 volts for ten seconds. The wire was gold-plated in the gold cyanide solution at 160 ° F. for five minutes at 6 volts.

2. 17-7PH austenitic steel band material was rolled, washed in soap and water and lightly sand-blasted. Gold plating was done in a constant temperature at 180 ° F. for 20 minutes at 7.5 volts. The gold cyanide solution consisted of 1.218 Gm. gold cyanide and 20 Gm. potassium cyanide per liter.

3. 17-7PH austenitic steel wire was anodically cleaned in the same solution and method as type 1. The wire was nickel flash-plated in Watts solution for five seconds at 6 volts, and then gold-plated in the gold cyanide solution at 160 ° F. for five minutes at 5 volts.

4. 80 nickel-20 chromium wire was anodically cleaned in the same solution as type 1, at 5 volts for five seconds. The wire was nickel flash-plated for five seconds at 6 volts in Watts solution and then gold-plated in the gold cyanide solution at 160 ° F. for five minutes at 5 volts.

The solder joints were prepared, using Lynco solder which consists of silver 40 per cent, copper 30 per cent, zinc 28 per cent, and nickel 2 per cent. The flux used was Lynco type H containing 10 per cent hydrazine. Of 613 joints made, 560 were subjected to the accelerated crevice corrosion tests.

The reported procedure for electrodeposition of a thin layer of gold on 18-8 or 17-7PH austenitic steel prior to soldering does not ensure a joint resistant to crevice corrosion.

80 nickel-20 chromium is substantially more resistant to accelerated crevice corrosion than the other rustless alloys tested, particularly when gold is flash-plated to the 80 nickel-20 chromium.

Columbia University, New York, N.Y.

Sterilization with small autoclaves

E. Mischol. *Schweiz.Mschr.Zahnhk.* 68:23-37 Jan. 1958

The sterilization apparatus is the most important piece of accessory equipment in the dental office. A number of methods are used for sterilization of dental instruments but the most efficient and practical method for the average dental office is superheated steam under pressure (autoclaving). Almost all microorganisms cannot survive ten minutes of direct exposure to steam at 249 ° F. (121 ° C.).

Superheated steam under pressure offers many advantages over boiling water, flaming, dry heat or chemical solutions. The use of comparatively small autoclaves assures the destruction of all bacteria, causes less corrosion of instruments, permits a more rapid sterilization and heats the objects more quickly.

Various types of small autoclaves are suitable for use in the dental office. Vertical autoclaves, however, have the disadvantage that they can be

filled only from above. The flow of the superheated steam in horizontal autoclaves must be from the top of the posterior region to the bottom of the anterior region. The escaping steam should be able to flow with as little resistance as possible. The thermometer should be near the steam outlet, and the pressure manometer at the container's top. A safety valve and door which seals automatically are indispensable attachments for even the smallest types of autoclaves.

The racks for instruments and syringes must permit free passage of the steam.

Every type of autoclave sold must have a certificate of suitableness for bacteriologic tests.

Vulcanizers, pressure cookers and boilers are unsuitable for sterilization of instruments in the dental office.

The dentist who is equipping or re-equipping his office should consider the advantages of autoclave sterilization. Although the cost of the autoclave may be higher than that of a hot water sterilizer, the benefits gained from superheated steam sterilization under pressure overshadow any monetary consideration.

Kreuzlingen, Switzerland

A central collaborative, cooperative animal registry

Austin H. Kutscher. *Bul.Midtown D.Soc.* 32:6-8 April 1958

Everyone called on to undertake investigations dealing with animals, particularly those requiring the eventual sacrifice of the animal, must pause with concern when regarding the fate man imposes on these creatures. Although each investigator has convinced himself that the ends and the purposes justify the means, the responsibilities are prodigious.

Often, a number of investigators work with the same drug in the same animal and examine its effect on different tissues. Such duplications involve an unwarranted expenditure of animals. One wonders if there is any justification for group A to administer cortisone to dogs in order to observe the effect on the adrenal glands and thereafter discard the animal at autopsy, while group B injects the same drug into other animals to investigate the effect on the thyroid gland and thereafter discards the remainder of these animals, while group C injects the same drug into still other animals to examine the gingivae and to take gingival biopsy specimens and thereafter discards the animals, and so on. Could not the same experiment have been performed by group A who would have removed the thyroid gland for group B and taken gingival biopsies for group C—all from the same animal?

Such collaboration would be of scientific importance in terms of saved effort and expense, increased scientific material which would be made available, reduced number of animals studied and sacrificed, and increased mutual interest and cooperation in investigators' problems. Needless duplication of animal experimentation would be minimized.

A central collaborative, cooperative animal registry has been proposed and undertaken by the committee on research of the Midtown Dental Society. A Mimeographed letter will be sent to the heads of each department of the dental schools in the metropolitan New York area, advising them of the program and requesting their cooperation to the extent of making available to the committee, for publication purposes or for redistribution to other institutions, those experimental procedures involving animals from which some material might be available to others for study. The committee will tabulate the offerings of material, correlate and prepare them for suitable publication in an appropriate journal, and redistribute a Mimeographed compilation to each cooperating individual, department or institution.

It is suggested that there be established (perhaps in various fields of study or geographic areas) one or more central laboratory animal exchanges where studies dealing with animals which eventually are to be sacrificed and autopsied are listed and posted by animal experimental procedure, tissues to be discarded, tissues to be utilized, and so forth.

The mutual cooperation of even so much as a pair of investigators on one subject would justify the entire expenditure of effort.

630 West 168th Street, New York 32, N.Y.

New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

A 48-page reference manual no. 485 describes the "Equipto" line of steel shelving, drawers, lockers, work benches, tables, and other office, storage, warehouse and shop equipment. *Equipto, Aurora, Ill.*

A new, swivel-handled hand mirror for the dental office is available in pastel colors to match any dental equipment. The "Zefco" mirror is 3½ inches in diameter, and is boilable. The mirror turns easily and folds flat. *Z F Manufacturing Co., Inc., 9207 Flatlands Avenue, Brooklyn 36, N. Y.*

A new electronic replacement timer, to replace mechanical timers on present x-ray machines, is available. The electronic timer is said to reduce radiation hazard, to save time, to utilize film to a better advantage, and to reassure the patient. The timer has a large dial. Literature is available. *Electronic Control Corp., 1573 East Forest Avenue, Detroit 7, Mich.*

A miniature, transistorized "Phono Trix" tape recorder operates on four flashlight batteries. The recorder measures 3⅛ by 4 by 6½ inches. It has automatic volume control, accomodates standard 3-inch reels, has a fast rewind and an automatic erasing device. The recorder operates 50 hours on one set of batteries. It plays back the recording on its own loudspeaker. *Burke and James, Inc., 321 South Wabash Avenue, Chicago 4, Ill.*

The Eberle "4 Second" syringe is designed for use with "Sil-E-Dent" and other types of impression materials. The syringe can be filled in four seconds, and disassembled just as speedily. It has four parts. It can be sterilized, cleaned and reassembled in 30 seconds. The syringe is described as economical to use, as a small amount of Sil-E-Dent, sufficient for a single inlay, can be applied. Literature is available. *Motloid Co., 325 West Huron Street, Chicago 10, Ill.*

The new Faries "Kold" lamp is incorporated in a line of adjustable, flexible-arm lamps. The outside shade is cold to the touch, even after a 75 watt bulb has burned continuously. "Friction Free" adjustments employ the gravity principle, and are virtually unlimited. Each lamp extends from 12 to 38 inches. Eight types of fluorescent and incandescent lamps are available. *Faries Lamp Division, Elwood, Ind.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Experimental studies on the dog and rat concerning the relationship of enamel permeability to dental caries. *Harold E. Brewer. 1958.* PH.D. *Indiana University.*

An investigation on the effects of various separating media upon the physical properties of stone. *Rashmikant H. Mehta. 1957.* M.S.D. *Indiana University.*

The preparation for an anterior three-quarter crown and a direct wax pattern. *Robert Duane Jeronimus. 1957.* M.S. *State University of Iowa.*

An evaluation of the accuracy of reproduction of the partially edentulous mouth with elastic impression materials. *Robert W. Shippee. 1958.* M.S. *University of Michigan.*

Fractures of the mandibular condyle. *Allen W. Weiss. 1958.* M.S. *University of Michigan.*

An evaluation of a liquid latex rubber space maintainer. *Marion L. Ralls, Jr. 1958.* M.S. *Univeristy of North Carolina.*

A functional radiographic investigation of the nasal and oral pharyngeal structures during deglutition in cleft palate individuals. *Barrett D. Anderson. 1958.* M.S.D. *Northwestern University.*

A radiographic survey of plaster casts showing tooth and basal arch forms before and after orthodontic treatment. *Alan E. Besas. 1958.* M.S.D. *Northwestern University.*

A comparative study of the cephalometric and temporomandibular joint radiographic method, and gnathothesiometric method of studying the retruded hinge movement of the mandible. *Donn D-B. Chung. 1958.* M.S.D. *Northwestern University.*

A comparative histologic and cytologic study of human oral tissues utilizing fluorescence and visible light microscopy. *Alvin Carl Hileman. 1957.* M.SC. *Ohio State University.*

The application of the ultrasonic dental unit to scaling procedures. *Walter Nels Johnson. 1957.* M.SC. *Ohio State University.*

Cephalometric appraisal of white fraternal twins. *Robert Gnam Meisel. 1958.* M.S. *University of Pittsburgh.*

Pattern and variations of the facial skeleton in a random group of American Negro children. *Henri Ernest Nodiot. 1958.* M.S. *University of Pittsburgh.*

Course of the caries frequency curves in Germany after World War II (Der Verlauf der Kariesfrequenzkurve in Deutschland nach dem Weltkriege, 1939/45). *Alfred Maurer. 1957.* DR.MED. DENT. *Dental School, University of Mainz, Germany.*

Blood count in periodontal lesions (Il quadro ematico nelle affezioni del paradentio). *U. Veneroni. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

Salivary corpuscles (Il corpuscoli salivari). *F. Lizzi. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

Etiopathology of bruxism and bruxomania (Etiopatogenesi del digrignamento notturno dei denti). *G. Franzoni. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

Traumatic occlusion (L'occlusione traumatica). *G. Motta. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

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